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TP 7435E

MULTI-PURPOSE VEHICLE FOR INTEGRATED RURAL SERVICE

Development of Specifications Prototype Vehicle for Demonstration Program

Prepared For

TRANSPORTATION DEVELOPMENT CENTRE

TRANSPORT CANADA

March 1986

T E S Report Number: C584/3-1

Library and Information Centre / Transportation (CBLA)
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By

W.F. McCaffrey and D.A. Rolfe

T E S Limited

Ottawa, Canada

The contents of this report reflect the views of the contractor and not necessarily the official view or opinions of the Transportation Development Centre of Transport Canada.

Un sommaire en français de ce rapport est inclus avant la table des matières.

PROJECT TEAM

The project team for T E S Limited was composed of:

Mr. D.K. Woods, P. Eng.
Mr. W.F. McCaffrey, B. Eng.
Mr. D. Rolfe, P. Eng.
Ms. S.L. Smith, P. Eng.

for Sypher Consultants Inc.:

Ms. R.L. Monroe

for Rutenberg Design Inc.:

Mr. U. Rutenberg

The TDC Project Officer was Mr. R.S. Nishizaki.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the advice and assistance provided by Wes Graham of the Manitoba Highways and Transportation Department, Ian MacPherson of the Manitoba Health Services Commission, Girardin Inc., and Crestline Coach Ltd.

Transport Canada / Transports Canada

Development / Développement

REPORT DOCUMENTATION FORM

1. Transport Canada Report No.	2. TDC Project No.	3. Recipient's Catalogue No.
TP 7435E	6107/6545	

4. Title and Subtitle	5. Report Date
MULTI-PURPOSE VEHICLE FOR INTEGRATED RURAL SERVICE Development of Specifications/Prototype Vehicle for Demonstration Program	March 1986
	6. Performing Organization Report No. C584/3-1
7. Author(s) W.F. McCaffrey and D.A. Rolfe	8. Transport Canada File No. D1450-103-74
9. Performing Organization Name and Address TES Limited P.O. Box 9372 Ottawa, Ontario K1G 3V1	10. DSS File No. 15SD.T8200-3-3575-01 14SD.T8200-5-5567
	11. DSS or Transport Canada Contract No. OSD84-00217 OSD85-00261
12. Sponsoring Agency Name and Address Transportation Development Centre (TDC) Guy Favreau Complex 200 Dorchester Blvd. West, Suite 601, West Tower Montreal, Quebec H2Z 1X4	13. Type of Report and Period Covered
	14. Sponsoring Agency Code TDC 6107/6545
15. Supplementary Notes	16. TDC Project Officer R.S. Nishizaki

17. Abstract

This report describes the development of specifications for and the construction of a prototype multi-purpose vehicle for integrated rural service as a combined small bus/ambulance for elderly and handicapped passengers.

The specifications were based on the adaptation of a commerically available vehicle. The prototype vehicle can be accommodate five ambulatory passengers, or three wheelchairs and two ambulatory passengers, or one stretcher and an attendant at any one time. Access is provided by a wheelchair lift at the rear and by folding doors at the front of the vehicle.

The vehicle will be placed in demonstration service during which data will be collected to evaluate and refine vehicle design.

18. Key Words	19. Distribution Statement
Multi-purpose vehicle, van, bus, ambulance, elderly, handicapped, rural, integrated service	Limited number of copies available from the Transportation Development Centre

20. Security Classification (of this report)	21. Security Classification (of this page)	22. No. of Pages	23. Price
Unclassified	Unclassified		—

TDC/CDT 79-005
Rev 86

Canada

Transports Canada / Transport Canada
Développement / Development

FORMULE DOCUMENTAIRE DU RAPPORT

1. N° du rapport Transports Canada TP 7435E	2. N° de l'étude — CDT 6107/6545	3. N° de catalogue du destinataire
4. Titre et sous-titre **MULTI-PURPOSE VEHICLE FOR INTEGRATED RURAL SERVICE** **Development of Specifications/Prototype Vehicle for Demonstration Program**		5. Date du rapport mars 1986 6. N° du rapport de l'organisme exécutant C584/3-1
7. Auteur(s) W.F. McCaffrey et D.A. Rolfe		8. N° de dossier Transports Canada D1450-103-74
9. Nom et adresse de l'organisme exécutant TES Limited P.O. Box 9372 Ottawa, Ontario K1G 3V1		10. N° de dossier — ASC 15SD.T8200-3-3575-01 14SD.T8200-5-5567 11. N° de contrat — ASC ou Transports Canada OSD84-00217 OSD85-00261
12. Nom et adresse de l'organisme parrain Centre de développement des transports (CDT) Complexe Guy-Favreau 200 ouest, boul. Dorchester, Suite 601, Tour Ouest Montréal, Québec H2Z 1X4		13. Genre de rapport et période visée 14. Code de l'organisme parrain CDT 6107/6545
15. Remarques additionnelles		16. Agent de projet — CDT **R.S. Nishizaki**

17. Résumé

Ce rapport présente les spécifications d'un véhicule polyvalent pouvant servir aussi bien d'ambulance que de minibus rural pour le transport des personnes âgées et des handicapés.

Ces spécifications sont celles d'un véhicule courant modifié selon les besoins particuliers définis. La construction du prototype a débouché sur un véhicule pouvant recevoir soit cinq passagers, soit trois fauteuils roulants et deux passagers ou une civière et un ambulancier. Le véhicule comporte une plate-forme élévatrice à l'arrière et une porte latérale pliante, à l'avant.

Ce véhicule sera exploité en service expérimental dans le double but de l'évaluer et de l'améliorer.

18. Mots-clés Véhicule polyvalent, fourgonnette, bus, ambulance, personnes âgées, handicapés, transport rural, service intégré	19. Diffusion Le Centre de développement des transports dispose d'un nombre limité d'exemplaires

20. Classification de sécurité (de ce rapport) non classifié	21. Classification de sécurité (de cette page) non classifiée	22. Nombre de pages	23. Prix --

CDT/TDC 79-005
Rev 86

Canada

SUMMARY

This report describes the development of specifications for and construction of a multi-purpose vehicle for integrated rural service. This project was initiated as a result of previous work by the Government of Manitoba and Transport Canada to define and fulfill a requirement for a combination of small bus and ambulance for the transportation of elderly and handicapped persons.

A need for this type of vehicle exists in small communities that cannot support dedicated ambulance and handicapped van services.

Discussions were held with Government of Manitoba and Transport Canada personnel to assist in defining the requirements for the vehicle. It was determined that a design based on an existing commercial vehicle would provide the simplest and most cost-effective solution. It was concluded that the interior arrangement should be easily and quickly convertible to provide a combination of wheelchair positions and seats for the handivan role or a cot and seat for the stretcher configuration.

After these requirements had been formulated, information was assembled on suitable commercially available vehicles and components. As well, all applicable codes and regulations were reviewed. A specification was drafted based on the foregoing requirements and information and a quotation for the construction of the vehicle was obtained. An order was issued, and following completion of construction, the vehicle was inspected and approved for delivery to Manitoba.

The vehicle which is a modified Ford E350 van is capable of transporting five ambulatory passengers, or three wheelchairs and two ambulatory passengers, or one stretcher and attendant at any one time. Access is provided by a wheelchair lift at the rear and folding doors at the front of the vehicle. For the stretcher configuration, all the necessary equipment kits normally included in an ambulance will be available at the garage for quick loading onto the vehicle.

Based upon the anticipated usage of the vehicle, a demonstration plan was developed. The objectives of this program are to assess the feasibility, technical performance and costs of the vehicle in service. Data for evaluation will be gathered over a two year period as the prototype vehicle is placed in operation.

The community of Minitonas was recommended as the site for the demonstration. The community is representative of many small settlements not large enough to merit a dedicated ambulance or handicapped van service, and having a number of mobility disadvantaged individuals.

A number of options are presented to manage the logistics of operating the vehicle, based on prior experience with similar operations.

SOMMAIRE

Ce rapport décrit l'étude et la réalisation du prototype d'un véhicule polyvalent, combinant les rôles d'ambulance et de minibus, destiné aux personnes âgées et aux handicapés en milieu rural. Un tel véhicule, dont les besoins ont été précédemment définis par le gouvernement du Manitoba et par Transports Canada, convient surtout aux petites municipalités n'ayant pas les moyens d'acquérir des véhicules distincts pour ces deux rôles.

Les discussions entre le gouvernement du Manitoba et Transports Canada sur le moyen de répondre aux besoins définis ont mené à la conclusion que le meilleur moyen, et le plus économique, serait d'adapter un véhicule déjà sur le marché par un aménagement intérieur facilement et rapidement convertible pour donner une version passagers ordinaires et passagers en fauteuil roulant, et une version porte-civière.

A partir de là, la recherche s'est concentrée sur le choix du véhicule le mieux adapté et de ses accessoires. De même, un tour d'horizon des codes et règlements applicables a été fait. Sur la base du cahier des charges rédigé par la suite, un appel d'offres a été lancé et une commande placée auprès du soumissionnaire retenu. Une fois construit, le véhicule a été inspecté et jugé apte à être livré au gouvernement du Manitoba.

Il s'agit d'une fourgonnette Ford E350 qui, après modification, peut transporter cinq passagers ordinaires, trois passagers en fauteuil roulant et deux passagers ordinaires ou une civière accompagnée. Elle est équipée d'une plate-forme élévatrice à l'arrière et d'une portière à deux vantaux à l'avant. Pour ce qui est du rôle ambulance, tout l'équipement nécessaire est stocké au garage, prêt à être chargé à bord à tout moment.

Un programme de démonstration a été étudié, fondé sur les utilisations auxquelles le véhicule doit se prêter. Il s'agit d'en évaluer la faisabilité, les performances et les coûts. La collecte des données de l'évaluation doit se faire sur une période de deux ans prévue pour la mise en service expérimentale.

La municipalité de Minitonas a été recommandée pour l'implantation du programme de démonstration, d'une part, parce qu'elle fait partie des petites localités ne pouvant s'offrir un service de transport semi-collectif et un service ambulancier distincts et, d'autre part, parce qu'elle compte plusieurs personnes à mobilité réduite.

Quant à la gestion, plusieurs possibilités ont été étudiées, fondées sur l'expérience acquise ailleurs dans le domaine considéré.

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Prototype Multi-Purpose Vehicle

1. INTRODUCTION

In numerous small rural communities, a requirement exists for both an ambulance and a small bus for the transportation of elderly and handicapped persons. Since the size of these communities limits the number of users of either service below that which would normally be considered as the minimum for the dedication of a vehicle to either service, it is possible that a single vehicle designed to fulfill both requirements would be feasible. A paper by Wallace (1) discusses this concept in detail.

In March 1985, T E S Limited was contracted by the Transportation Development Centre to develop, in conjunction with the Government of Manitoba, the specifications and demonstration plan for such a multi-purpose vehicle for integrated rural service. Subsequently, it was decided to proceed with the construction of the vehicle and implementation of the demonstration plan. T E S Limited was contracted to produce the prototype multi-purpose vehicle. This report describes the development of the requirements and specifications as well as the construction of the prototype vehicle. Further, a demonstration plan for the use of the vehicle is presented.

2. DEVELOPMENT OF SPECIFICATION

2.1 Definition of Requirements

Upon initiation of the project, a meeting was held with the TDC Project Officer and the Manager of Transportation for the Manitoba Department of Highways and Transportation to obtain their requirements and to discuss all aspects of the work in detail. The following relevant considerations emerged and are discussed as follows.

An adaptation of an existing commercial vehicle was felt to be highly desirable in order to simplify the design and procurement of the vehicle as well as to minimize acquisition and operating costs.

Typical operating conditions would be in a northern environment with extremes of temperature over frost-heaved gravel roads. This would require heavy-duty construction for the driveline, suspension and ancillary systems such as the cooling system. Climate control for the interior in the form of auxiliary heaters and air conditioners as well as cold starting aids would also be required.

The principal useage of the vehicle would be as a transport for elderly and handicapped passengers. Thus, the design of the interior should incorporate features such as wide individual seats with armrests, grab railings at entrances, and wide aisle clearances.

Since the primary role of the vehicle would not be as an ambulance, compliance with ambulance regulations would not be required. As well, ambulance equipment would not be required to be carried at all times. However, a combined ambulance/handicapped van communication radio should be provided.

2.2 Codes and Regulations

One of the guidelines for the design of this vehicle was compliance with all applicable codes and regulations. The appropriate regulations are as follows:

- Manitoba Highway Code
- Manitoba Ambulance Service Act
- CSA D409 Standard "Motor Vehicles for the Transportation of Physically Disabled Persons"

The Manitoba Ambulance Service Act is attached in Appendix "A" for reference as there are numerous provisions that pertain to this vehicle. Presently, the CSA Standard (2) is not a legal requirement in any province, however, it is scheduled to become a regulation in Ontario and is planned for introduction in Manitoba.

The CSA Standard specifies performance requirements for the vehicle body, brake, electrical and suspension systems, entrances, exits, seating,

wheelchair restraints, and the capacity, operation, safety and performance of the lift itself. The Manitoba Ambulance Service Act contains similar provisions for the vehicle as well as exterior and interior lighting, medical and communication equipment, and training and licencing requirements for drivers and attendants.

2.3 Survey of Manufacturers

Using the resources of the Transportation Development Centre as well as contact with the manufacturers, information was assembled on available lift-equipped vans, ambulances and accessories including ambulance equipment, wheelchair restraints, and seats. This information was reviewed in detail and the most suitable equipment was identified for use in the development of the specifications.

2.4 Vehicle Specification

A draft specification was developed based on the foregoing requirements and survey results. This specification was issued to the TDC Project Officer and the Manager of Transportation Programs for the Manitoba Department of Highways and Transportation for their comments and approval. The final version is attached in Appendix "B".

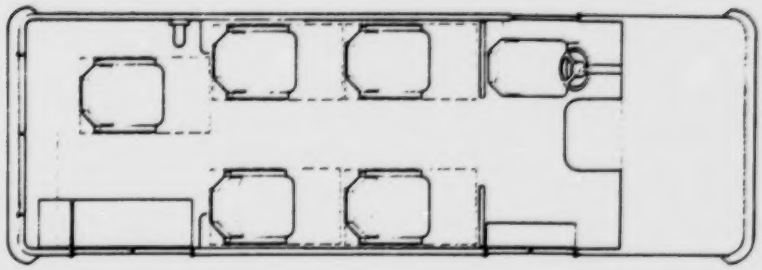
During the course of the survey of manufacturers, two qualified manufacturers were identified. A request for quotation was sent to these companies for a vehicle based on the above specifications. One company declined to quote, and the response from the other company is contained in Appendix "C".

2.5 Design and Description of Interior Configurations

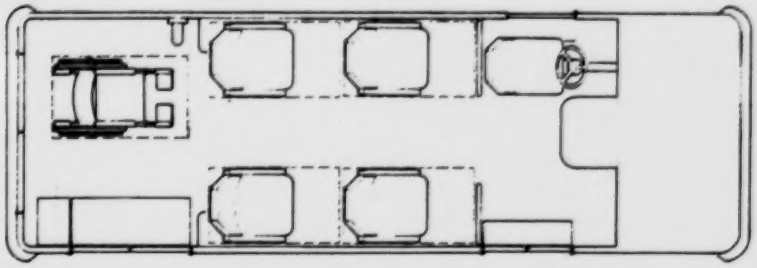
Since the most frequent intended use of the vehicle was the transportation of elderly and handicapped passengers, ease of access and interior comfort were of primary importance in determining the interior layouts. Thus, the seats specified were of a high back type with individual folding armrests and aisle widths were to be at least 51 cm (20 in).

The starting point for interior arrangements was a floorplan of the vehicle, drawn up from information supplied by the manufacturer. The wheelchair lift is positioned on the right side behind the rear axle and double entrance doors are located on the right side beside the driver's seat. The various arrangements are shown in Figure 1 and detailed as follows.

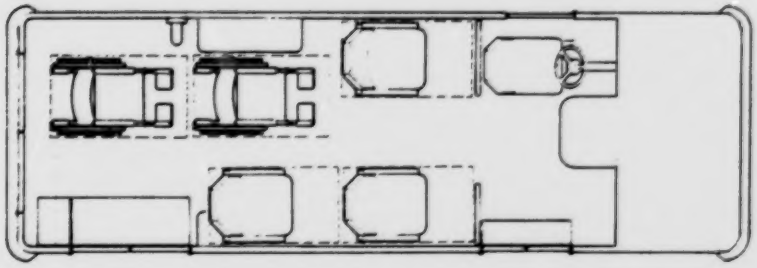
In the mini-bus configuration, five individual seats are provided. This arrangement of seats was arrived at as the maximum number of seating positions that could be accommodated while retaining adequate seat and aisle widths for elderly and mobility impaired passengers. Double seats were found to offer insufficient room for access to the ambulatory doors and the emergency exit at the rear. Of the five seats, four are removeable and one is permanently mounted on a swivel base over the right rear wheel. The removeable seats attach to flush mounting plates in the floor. To remove the seat, four wingnuts on the base are loosened and the



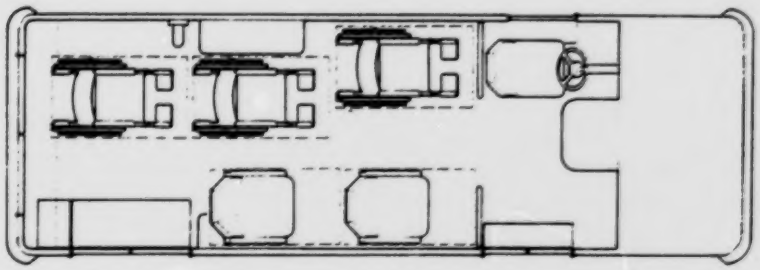
5 Ambulatory Seats



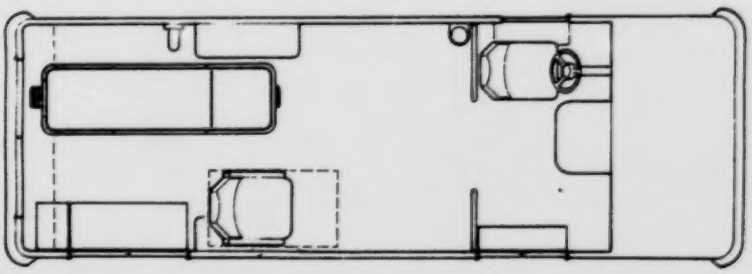
4 Ambulatory Seats
1 Wheelchair Position



3 Ambulatory Seats
2 Wheelchair Positions



2 Ambulatory Seats
3 Wheelchair Positions



1 Cot
1 Ambulatory Seat

Figure 1 Alternative Interior Arrangements

seat is pulled slightly rearward and up.

To convert to a handicapped van, three seats behind the driver's seat are removed, and replaced with wheelchair restraint systems. A lesser number of wheelchairs may be accommodated, in which case each wheelchair position is replaced by an ambulatory seat. It was felt that , due to the size of the communities being served, it was unlikely that any more than three wheelchairs would have to be transported together. Figure 2 illustrates this arrangement.

In the stretcher-carrying configuration, a swivelling seat is required near the head of the cot occupant for an attendant. The cot is placed near the lift side of the vehicle at the rear with the head of the cot occupant facing forward. This arrangement is based on present ambulance practice. The various medical kits are stored ahead of the wheel wells on both sides of the vehicle, and the cot is secured by a removeable quick release fastener. This configuration is illustrated in Figure 3.

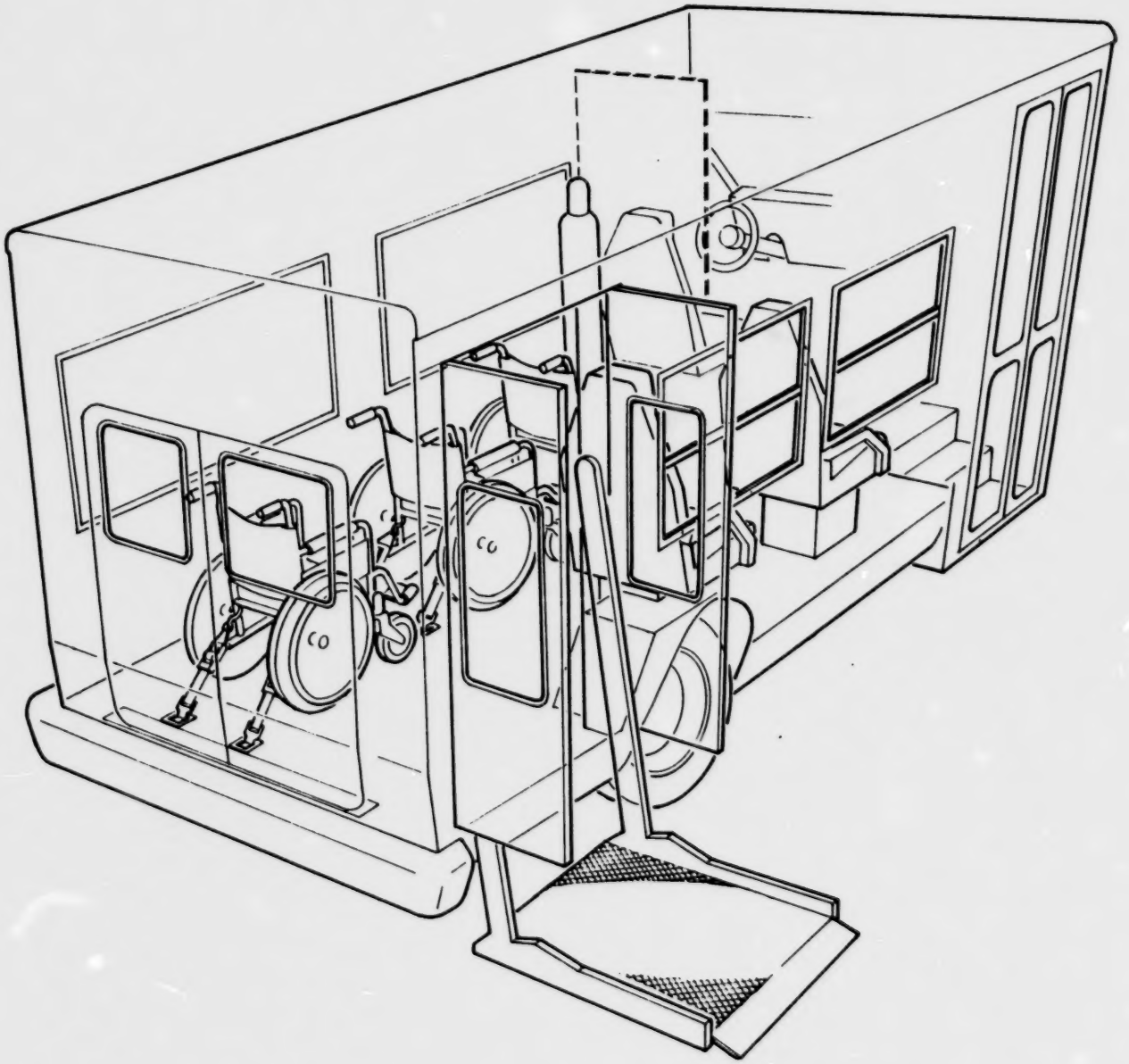


Figure 2 Handicapped Van Configuration

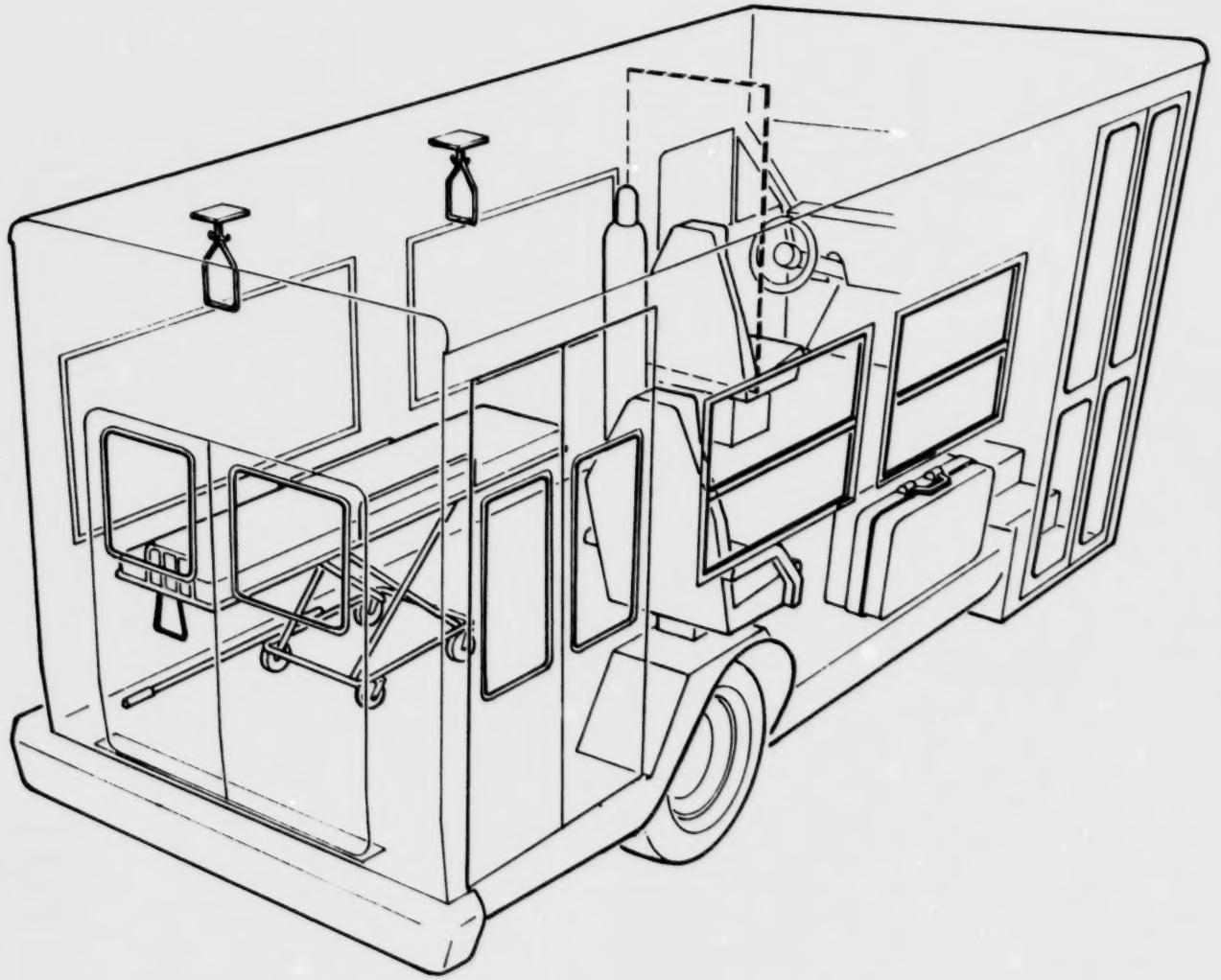


Figure 3 Stretcher Configuration

3. CONSTRUCTION OF PROTOTYPE VEHICLE

Following approval by the TDC Project Officer, a contract was arranged with Girardin Corp. of Cambridge, Ontario to supply a prototype vehicle as specified in Appendix "B". This vendor had previously supplied a quotation for construction of the vehicle (as shown in Appendix "C") and was assessed to have acceptable qualifications and experience to undertake this project.

The vehicle was based on a Ford Econoline E350 Van cab and chassis with a fabricated steel body and extended chassis behind the rear axle. These modifications were fabricated by Girardin Corp. and provide greater floor area and headroom than the standard body. The driveline consists of a 351 cubic inch 8 cylinder gasoline engine and automatic transmission.

A finishing scheme was arrived at in consultation with the TDC Project Officer, Transport Canada Public Affairs and the Manitoba Highways and Transportation Department. The basic vehicle is finished in white with a blue stripe below the windows. On this stripe is lettering identifying the community and below the stripe are messages from the Governments of Canada and Manitoba identifying financial support for the purchase and operation of the vehicle. Figure 4 shows two views of the completed vehicle.

The vehicle was inspected during and after construction to ensure compliance with the intention of the specifications.

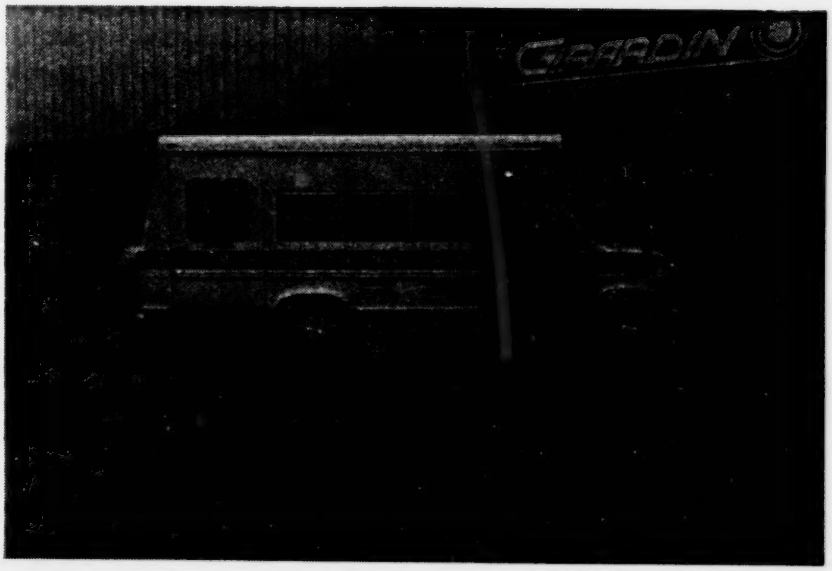


Figure 4 Views of Completed Vehicle

4. DEMONSTRATION PLAN

In consultation with the Manitoba Manager of Transportation Programs, a plan to demonstrate the use of this vehicle was developed and is attached in Appendix "D". A summary of this plan follows.

The demonstration plan would follow the philosophy of the existing grant programs for ambulance and handicapped van service in that details of the operation and management of the services are left for the community to resolve in the manner most suited to the needs of the area being served. The overall objectives of the plan are to monitor and assess the feasibility, technical performance and costs associated with the operation of the vehicle in rural service.

In consultation with the Government of Manitoba, the community of Minitonas was selected as typical of those villages that required the services of both a handicapped van and ambulance but could not afford to operate these services. Minitonas is located approximately 470 km northwest of Winnipeg and has a population of 610, of whom over one quarter are 65 years old or greater.

The operation of the service can be handled using various methods, depending on the requirements of the community. Drivers can be employed on a full-time, part-time or volunteer basis and the dispatcher can be located in a private home, municipal office or nursing home. User fees should be established that cover at least 25% of the operating expenses.

The evaluation of the vehicle will be based on data gathered in the following areas; usage, technical performance and operating costs. Sample forms are provided to record usage and operating costs. A log will be kept of vehicle maintenance and comments. This data will be collected over a two year period. An interim data summary and report should be issued after the first year and a comprehensive evaluation report prepared after the completion of the demonstration program by Manitoba.

5.0 RECOMMENDATIONS

A combination of commercially available chassis, body and interior fittings has been specified and a prototype vehicle constructed to meet the requirements of rural communities. This vehicle will be placed into service as outlined in the demonstration plan.

It is recommended that, following the demonstration period, further vehicles be purchased incorporating refinements as defined by the results of the demonstration plan. This design could then be standardized for large scale production by various manufacturers.

REFERENCES

1. Multipurpose Vehicles as a Solution to the Need for Transportation of the Elderly and Handicapped in Small or Isolated Communities, Wallace, J. and Rea, J.C., Pre-Prints of Papers, Vol. 2, K-W, Third International Conference on Mobility and Transport of Elderly and Handicapped Persons, October 1984, Orlando, Florida.

2. Motor Vehicles for the Transportation of Physically Disabled Persons CAN3-D409-M84, April 1984, Canadian Standards Association.

Appendix A

Manitoba Ambulance Service Act

PROPOSED AMBULANCE SERVICES ACT

REGULATIONS

1 (a) "LAND AMBULANCE" means any motor vehicle that is used, or intended to be used, for the transportation of patients and that is specifically designed, constructed, marked and equipped for that purpose

(b) "AMBULANCE SERVICE" means the operation of one or more ambulances

(c) "ATTENDANT" means a person who is duly qualified and licenced under this regulation to attend to and assist with the needs of a patient or patients prior to and/or during transportation by ambulance

(d) "DRIVER-ATTENDANT" means a person who is licenced as an attendant under (c) of section 1 and is appropriately licenced under the highway traffic act to drive a vehicle of this classification

(e) "COMMISSION" means the MANITOBA HEALTH SERVICES COMMISSION

(f) new "HEALTH OFFICER" means the Director of Public Health Services appointed under The Department of Health Act and includes any person who, under that Act, The Public Health Act, or The Health Services Act is, or is appointed as, a medical officer of health or as medical director of a local health unit

(g) "HOSPITAL" means a hospital as defined in The Hospitals Act

(h) new "OWNER" includes any person, carrying on the operation of an ambulance service which may be a community or a Board

(i) "PATIENT" means a person who is sick, injured, wounded, incapacitated or in need of medical attention, and requires tranportation

(j) new "AMBULANCE STANDARDS OFFICER" means a person appointed or hired by the commission to inspect and maintain the operating standards of all ambulance services in the province

(k) new "MANAGER" means the manager of the Emergency Health and Ambulance Services section of the commission or the person so appointed in the manager's absence

(l) new "AMBULANCE TRAINING OFFICER" means a person appointed or hired by the commission to develop, present and maintain ambulance training programs in Manitoba

(m) new "DISPATCHER" means a person who is employed, qualified and licenced under this regulation to:

1) receive a request for ambulance service

2) initiate an ambulance response

3) coordinate ambulance communications and interrelate with other emergency services

(n) new "EMERGENCY" means any situation that is potentially hazardous to life or proper function of limbs or vital organs and where delay in the provision of proper treatment could be harmful.

2 Except as provided in this regulation, no person, by himself or by an agent or employee, shall:

(a) Operate, conduct, maintain, carry on or purport to carry on, advertise or otherwise hold himself out as operating an ambulance service

(b) drive or operate, or cause to be driven or operate any ambulance

(c) attend upon or assist in the transportation of a patient by ambulance unless he holds a valid and subsisting service and attendant or driver/attendant licence issued by the commission and performs these duties with a licenced service.

3 Section (2) does not apply to

(a) the Government of Canada or any agency thereof

(b) any person who, without compensation, attends or assists in the transportation of a patient by ambulance at the request of a medical practitioner or a person in charge of an ambulance, or

(c) any person who uses a motor vehicle to provide or assist in providing ambulance service arising out of a civil disaster or a war emergency proclaimed under the Emergency Measures Act.

4 Each owner of an ambulance

(a) shall apply to the commission for a licence for the operation thereof

(b) shall file with the commission such information in respect of the application as the commission may require

(c) shall apply to the commission for a licence for each ambulance attendant or driver/attendant prior to that person being utilized by the service whose qualifications are as described in Schedule "A"

(d) shall not operate the ambulance or allow it to be operated unless he has a licence for an ambulance service

(e) shall not operate an ambulance that has been deemed unfit by a motor vehicle branch inspector or ambulance standards officer.

5 Each owner of an ambulance service shall ensure that each vehicle used in the service he operates:

(a) is constructed, equipped and marked in accordance with the specifications outlined in schedule "B"

(b) is maintained in a clean and safe mechanical condition

(c) contains all the ambulance accessory equipment in the quantities required as outlined in the specifications in schedule "B"

(d) contains all the patient care equipment and supplies for the level of training, in the required quantities as outlined in schedule "C" and

(e) otherwise each ambulance shall contain no additional equipment except

i) specific equipment approved by the local ambulance service Committee/Board for use in or on that services vehicle(s) or

ii) a specific item of medical equipment that a physician orders to be transported to or with a patient in a specific situation

5 (1) (f) shall be covered by insurance in respect of each vehicle for not less than two million dollars inclusive, or such other sum as may be required by M.P.I.C., in respect of liability arising from bodily injury to, or the death of, one or more persons, including

6 (1) (f) a properly constituted ambulance committee or board is in place and responsible for the ambulance service, with representatives from the municipalities/towns in which the ambulance service operates and a representative of the medical staff of the local hospital(s)

6 (1) (g) in the case of a privately owned ambulance service

i) the above (a) (b) (c) (d) (e) (f) apply and

ii) a contract struck with the board

6 (2) Where the commission refuses a licence, it shall, upon request, give the applicant reasons for refusal of the licence; and the applicant may appeal against the decision of the commission in the manner set out in subsection (8) of section 13

6 (3) Subject to subsection (4) a service licence issued under subsection (1) is valid for a period of one year, expiring on the 31st day of December

6 (4) Subject to section 13, the commission may suspend or revoke a service licence, for non-compliance with this regulation

6 (5) A licence issued under subsection (1) of section 6 may have placed upon it certain restrictions of operation as deemed necessary by the commission

6 (6) Subject to subsections (3) and (5) the commission may issue a licence for a period of less than twelve (12) months

7 (1) The commission shall not issue a licence for an ambulance service unless that owner complies with clause (f) of subsection (1) of section 5

7 (2) Upon cancellation or reduction of the insurance policy required under 5(1)(f) the ambulance service licence shall be deemed to be automatically revoked unless another policy that complies with 5(1)(f), is in effect

8 Each application for renewal of a licence shall be deemed to be a new application

9 (1) The commission shall cause to be inspected, annually or at any other time as deemed necessary, each vehicle used in the provision of ambulance service, the premises in which said vehicle(s) is housed and other operational and administrative aspects of the service (e.g. dispatch system, administrative liaison, manpower etc.)

9 (2) new Written notice shall be given by the commission to the owner when a complete inspection is to be conducted.
Obstruction of the conduct of such inspection or the provision

of false or misleading information to the Standards officer, may result in the cancellation of the ambulance licence

9 (3) Following such inspection the commission shall supply the owner with a written report detailing any necessary changes, to be acted upon as deemed appropriate by the commission.

10 (1) Each service authority shall ensure that all staff involved with:

a) the dispatching of an ambulance or

b) the operation of an ambulance and the care of patients

shall complete the required form, for the purpose of recording information, in respect of each ambulance call

10 (2) Each owner will ensure that an adequate supply of all such forms, required under subsection (1) and provided by the commission, is available at all times.

10 (3) Each owner is responsible for the deployment of the copies of all forms required under subsection (1) and shall do so within fifteen (15) days of the end of the month in which the call took place or sooner if requested by the commission or its agent(s)

10 (4) The owner will submit, upon reasonable request, any information pertaining to the ambulance service operation when so requested by the commission or its agent(s).

11 (1) Each person who is employed or engaged as, or assists in the operation of an ambulance service as an attendant or driver/ attendant, shall apply to the commission for a licence and shall file with the commission such information, in respect of the application, as the commission may require

11 (2) A licence issued under 11(1) is valid for a period expiring on the 31st day of December of the year in respect of which it is issued.

11 (3) The name and other particulars of the applicant shall be entered, along with the licence number, in the register maintained by the commission. All licenced persons are responsible for notifying the commission of changes regarding name, address and/or training status.

12 (1) No person shall be licenced in any category set out in schedule "A" unless that person has the appropriate qualifications and is associated with a licenced ambulance service.

13 (1) Subject to subsections (2) and (6), the commission may, suspend or revoke any licence at any time for non-compliance with this regulation, or for any other cause that, in the opinion of the commission, might adversely affect the safety and proper care of a patient

13 (2) Where the commission is considering the suspension or revocation of a licence, it shall, at least ten days before determining the matter,

serve a notice upon the service and/or person whose licence may be affected; and the notice shall state a time and place at which that person or persons may appear, and shall have an opportunity of making any representation as to why the licence should not be suspended or revoked

13 (3) A notice under subsection (2), may be served personally upon the person whose licence is affected, or it may be sent to him by registered mail addressed to him at his address as it appears in the records of the commission

13 (4) Where, after an inquiry, the commission is satisfied that cause has been shown that the licence should be suspended or revoked, it may

a) suspend the licence for such period of time and subject to such conditions as the commission may deem fit; or

b) revoke the licence

13 (5) Where a licence is suspended or revoked, the commission shall forthwith notify in writing the person whose licence is suspended or revoked, by registered mail addressed to him at his address as it appears in the records of the commission, setting out the reasons for the suspension or revocation. A copy of this notification shall be sent to:

i) in the case of an individual attendant or driver/attendant licence: the manager(s) of service(s) with which this individual, according to commission records, is involved

ii) in the case of a service: the ambulance committee and/or the municipality(s) contracting with that service

13 (6) The commission shall not suspend or revoke a licence unless the licensee has had an opportunity of appearing before the commission and be heard in the matter as provided herein

13 (7) Where, after an inquiry, a licence has been suspended or revoked by the commission, the person affected by the decision of the commission may appeal against the decision to the minister

13 (8) A person appealing to the minister against the decision of the commission under subsection (4), shall, within ten days of the receipt of the notification of the decision of the commission, serve on the minister and the commission by registered mail a notice of appeal

13 (9) The minister may

a) confirm; or

b) quash;

the decision of the commission; or

c) vary any conditions relating to the suspension of the licence; or

d) reduce the time for which the licence has been suspended;

and the commission shall carry out the order made by the minister.

14 (1) Subject to clause (h) of subsection (1) of section 5 and to subsection (3) of section 6, the commission may, where it deems it to be necessary in the interest of public health or public safety, issue a provisional licence to the owner of an ambulance notwithstanding that the ambulance does not comply with clause (b) of subsection (1) of section 5.

15 (1) The commission shall set the minimum standards of operation and training for ambulance services in the province except those covered under section 3 paragraph (a)

15 (2) Training and examinations evaluated and acceptable to the commission, and which are proctored by its ambulance training officers, shall be the only standard by which provincial certification of ambulance personnel may be obtained

15 (3)(1) Only those patient care procedures recognized by and acceptable to the commission, shall be carried out by ambulance personnel

15 (3)(2) Each service and each individual requires written medical authorization to perform skills above their certified level training. Such authorization shall be subject to approval by the commission

15 (4) The commission may cause any person, certified under subsection (2)

of this section, to report for re-examination of skills in accordance with their certificate where:

a) the period for which the certificate was issued has expired

b) the commission has reasonable grounds to believe that the person may not be competent in performing, those skills, all or in part, required for their certification

15 (5) Where such re-examination is required, the commission will make a reasonable effort to notify the person(s) involved, by written notice, and will advise him of the place and time to report for such re-examination. A minimum of ten (10) days notice shall be provided

15 (6) Upon receipt of such re-examination notice the person(s) involved will attend at the location, at the specified time and take such exam

15 (7) Failure to attend, except for reasonable cause in the opinion of the commission, may cause the revocation or change in category of licensure

15 (8) The person in question may appeal the revocation or change in category in the manner set out in section 13

15 (9) The commission may cause a reclassification of licence dependant

on such skills re-examination.

16 (1) All owners of ambulance services will be responsible for developing and writing a service multiple casualty incident plan

16 (2) All multiple casualty incident plans shall be submitted to the commission and, where applicable to the local ambulance board for approval and/or recommendations

17 (1) No person shall permit the use or installation of a radio communication device that is capable of being operated on a frequency of 158.760 MH_z except where

a) it is contained in an ambulance as described in this regulation

b) it is part of an ambulance service dispatch system

c) the commission has given written permission for the use of such device

17 (2) All radio communication operation is subject to Department of Communication Canada Regulations and Operational Guidelines as set by the commission.

18 (1) The treatment and transportation of all known contagious disease cases must be in accordance with the Public Health Act

18 (2) No ambulance shall be used for transporting patients immediately after carrying a known contagious patient unless steps have been taken to disinfect the ambulance under The Public Health Act.

19 In all emergency cases, the driver of an ambulance will transport the patient to the nearest medical facility where the attention apparently required for the patient is available

Except: a) where directed by a physician or a dispatcher or

b) where categorization of hospitals has been approved the patient(s) may be transported to the designated appropriate facility.

20 In all cases of collision, involving an ambulance, regardless of damage value, the owner shall cause a report to be made in a form prescribed by the commission.

21 (1) Within two (2) years of this regulation coming into force each ambulance service with a call volume of under 500 calls annually will provide at least one First Responder certified attendant on each call

21 (2) Within two (2) years of this regulation coming into force each ambulance service with an annual call volume of 500 or greater will ensure that all driver/attendants and attendants are certified to

a minimum of First Responder

21 (3) Within two (2) years of this Regulation coming into force each ambulance service, employing full-time attendants, will ensure that all driver/attendants and attendants are trained to the CMA Level 1 as a minimum. Any advanced procedures instituted above CMA Level 1 to be under the supervision of a licenced physician experienced in acute care.

22 (1) All persons

i) involved in the operation of an ambulance service or

ii) the handling of patient information arising out of such operation are required, upon commencement of employment, to read the Code of Ethics and sign an oath of confidentiality as prescribed by the commission

22 (2) Any person found by the commission to have contravened the oath shall be liable to suspension or revocation of licence and fine or both. Appeal mechanism of section 13 applies.

23 The owner, attendant, driver/attendant or dispatcher of any ambulance service operating in the province as of the first day of April 198__ shall comply with this regulation within one (1) year from the date on which it comes into force except as provided in section 21 subsection (1) (2) and (3).

LICENCE CATEGORIES AND QUALIFICATIONS SCHEDULE "A"

1 (1) AMBULANCE ATTENDANT

a) minimum 18 years of age

b) read, write and speak English with reasonable fluency

c) not have been convicted of any crime, under the Criminal Code of Canada, for a period of at least three (3) years prior to employment with or engagement to an ambulance service

d) be in possession of a valid and subsisting St John Ambulance basic first aid certificate or equivalent as approved by the commission and a basic rescuer C.P.R. certificate issued by the Manitoba Heart Foundation

e) have an adequate knowledge of hospitals and geography of the service catchment area

1 (2) AMBULANCE DRIVER/ATTENDANT

a) hold a valid and subsisting Manitoba Driver's Licence of Class 4, 3, 2 or 1

b) all qualifications under section 1 (1) and ~~in addition~~ hold a valid and subsisting Manitoba Driver's Licence of Class 4, 3, 2 or 1

2 FIRST RESPONDER

a) all the qualifications set out in 1 (1) plus

b) successful completion of the Provincial Examination for First Responder

3 E.M.A. 1

a) qualifications under 1 and 2 plus

b) successful completion of E.M.A. 1 Provincial Exam or equivalent as approved by the commission

4 E.M.A. 11

a) qualifications under 1, 2 and 3 plus

b) successful completion of E.M.A. 11 Provincial Exam or equivalent as approved by the commission

5 E.M.A. 111

a) qualifications under 1, 2, 3 and 4 plus

b) successful completion of E.M.A. 111 Provincial Exams or equivalent as approved by the commission

6 SUPERVISORS

All those employed in any supervisory capacity relating to air ambulance service shall be trained at least to the same minimum standard as that for a Driver/Attendant in that service and subject to the requirements of the same Regulation

November/1984

VEHICLE SPECIFICATIONS AND EQUIPMENT SCHEDULE "B"

1. AMBULANCE DEFINITION

The ambulance is defined as a vehicle licenced for emergency care which provides a driver compartment and a patient compartment to accomodate an emergency medical attendant (EMA) and tow litter patients so positioned that at least one patient can be given intensive support during transit; a vehicle which carries equipment and supplies for emergency care at the scene as well as during transport, for two-way radio communication, for safeguarding personnel and patient under all environmental conditions and for light rescue procedures and which is designed and constructed to afford maximum safety and comfort and to avoid aggravation of the patient's condition, exposure to complication and threat to survival.

2. CLASSIFICATION: Ambulance types, classes

2.1 Type 1 - Conventional, cab-chassis with modular ambulance body:

Class 1-Two rear wheel drive
Class 2-Four-wheel drive

2.2 Type 11 - Standard van, integral cab-body ambulance:

Class 1 - Two rear wheel drive
Class 2 - Four-wheel drive

2.3 Type 111 - Specialty van, integral cab body or containerized modular ambulance:

2.4 Type 1V - Other vehicles which meet with the standards of an ambulance as laid down in this document.

3. VEHICLE - MANUFACTURERS STANDARD

3.1 Transmission

- automatic
- minimum three-speed with external oil cooler
- optional four-speed automatic with oil cooler

3.2 Engine

When loaded to the G.V.W.R. the ambulance shall be capable of ascending and descending not less than a 40% grade and be able to stop and restart while on the grade

3.3. Brakes

Power assist as recommended by the chassis manufacturer

3.4 Steering

Ppwer assist as recommended by the chassis manufacturer. Steering system shall achieve the turning circle specified in 6.1.5

3.5 Alternator

Heavy duty of not less than 100 amps.

3.6 Headlights

As recommended by chassis manufacturer. Or may be modified so long as they meet with standards set forth by the Manitoba Motor Vehicle Branch

3.7 Gear Ratio

Decision of local committee and ambulance manufacturer as per their recommended ratio

3.8 Fuel Range & System

The ambulance shall be capable of operating for at least 400 kilometers or 250 miles under average conditions without refueling. If more than one tank is furnished, tank shall have dash mounted fuel guage controlled by selective switch to permit fuel reading for each tank

3.9 Shock Absorbers and Suspension

Shock absorbers, double-acting type, heavy duty as offered by manufacturer. Suspension components shall have a rated capacity in excess of the load imposed on each member. Vehicle spring shall be chassis manufacturer's lowest clamped deflection rating offered. Suspension stabilizer devices shall be furnished when available to the model chassis

3.10 Glass

Shall conform with Canada Motor Vehicle Safety standards

3.11 Cooling System

The engine cooling system shall be closed, air free liquid state type with the heaviest duty components and maximum size cooling system available from the chassis manufacturer applicable to the vehicle offered. Verification test, the cooling system shall be capable of allowing the engine to idle at 1000 R.P.M. for a period of not less than 40 minutes in ambient temperature of 95 degree F./34 C. with full heater/air conditioning, and primary warning lighting loads on during test

3.12 Exhaust System

The exhaust shall discharge at the side(s) of ambulance away from any door(s) to minimize fumes and contaminants entering the interior

3.13 Tires

Unless otherwise specified, tires shall be (radial type) regular highway tread, chassis manufacturer's standard tires furnished for the G.V.W. of the vehicle. All tires furnished shall be alike to provide a safe and softer riding quality

4. AMBULANCE STANDARDS

4.1 Minimum Type 11 Vehicle Physical Dimensions

4.1.1	Length - Bumper to Bumper	220 inches or 558.8 c.m.
4.1.2	Width - Without mirrors	79 inches or 201.0 c.m.
	with mirrors	84.6 inches or 215.0 c.m.
	Interior Rib to Rib (@ floor)	70 inches or 177.8 c.m.
4.1.3	Height - Outside, ground to roof	77 inches or 195.6 c.m.
	Interior after conversions floor to ceiling (@ centre)	51.5 inches or 130.8 c.m.
4.1.4	Ground Clearance - Ground to lowest point of A-frame	7.9 inches or 20.0 c.m.

4.1.5 Turning Radius

- Wheel to wheel 50.36 feet or 15.35 metres

4.1.6 Wheelbase 125.0 inches or 317.5 c.m.

4.2 Gross Vehicle Weight (G.V.W.)

The ambulance gross vehicle weight rating shall be in excess of the combination of the vehicle's curb weight and the payload weight. The ambulance manufacturers shall provide a rating table that is permanently affixed and easily visible

4.3 Driver's Compartment

The cab of type 1, 11 or 111 shall be organized and designed with the specified and required equipment and accessories for ease of operation and safety. The cab and cab body of the drivers compartment shall comply with Canadian Vehicle Safety Standards and the safety standard of the chassis manufacturer

4.4 Driver and Passenger Seat

The driver compartment shall be furnished with two individual bucket-type seats (except Type 1 vehicles). All seats shall be frame constructed with maximum riding comfort. The covering shall be fire retardant, washable and non-absorbent material. The driver seat shall be adjustable to a minimum of four inches forward or backward. The seat and mounting must conform to the Canadian Vehicle Safety Standards

4.5 Exterior Mirrors

Single below eye level mirror with a minimum of 96.8 sq. cm. of usable reflective area shall be mounted on each side. A convex mirror of 10 cm. diameter shall be mounted to the lower end of each mirror frame. All mirror heads shall be independently adjustable

4.6 Body, General Construction

The body shall be of prime commercial quality metal or other material with strength at least equivalent to all steel. Wood shall not be used for structural framing. The exterior of the body shall be finished smooth with symmetrically rounded corners and edges including rub rails, presenting a modern and aerodynamic appearance

The unit shall have a designed strength sufficient to support the entire weight of the fully loaded vehicle on its top or side if overturned, without permanently deforming the unit

4.7 Ambulance Body Structure

All parts of the body and attachments shall be fastened together with rust-resistant fasteners in a manner which will preclude loosening of bolts, screws, and rivets, and cracking of welded joints. Metal tapping plates welded to the body, or framing to provide firm securing for installed equipment and cabinets, benches, partitions, cylinder, cot holders, et cetera shall be employed in the structure. Self-tapping (wood/metal) screws or nails shall not be used in assembling ambulances. When wood is being used, machine screws with nuts shall be used

Roof panels of fiberglass/plastic materials shall have the centre reinforced with metal wire screening for crash worthiness and radio ground plane. All extended roofs shall be permanently fastened to structural members of the body by being welded, bolted, and sealed to prevent separation in an accident

4.8 Insulation

The entire body including floor of the patients' compartment shall be insulated to ensure normal satisfactory performance in ambient temperatures of -40C to +40 C.

The insulation shall be nonsettling type, mildewproof, fire retardent

4.9 Body Mounting, Type One and Three Vehicles

Mounting devices shall be locked units which will minimize loosening, but which may be tightened if necessary. Type one and three bodies shall have at least four (4) high-strength 5/8 inch bolts or equivalent, to attach the body brackets to the frame/chassis outriggers on each side, mounted so as to prevent any side movement of the body. Anti-squeak material shall be used between body frame and chassis

4.10 Floor Plan, Cot Placement and Squadbench

Unless otherwise specified, loading arrangements shall be provided in the patients' compartment so that the head of the patient is forward in the vehicle

One patient (primary patient) on elevating cot and one patient (secondary patient) lying on a folding stretcher or combination stretcher chair on the squad bench platform, or one primary patient and three secondary seated patients on the squad bench and one seated attendant. The main cot shall be located on the left side of the vehicle

4.11 Floor

Floor shall be at the lowest level permitted by the chassis/ body but not more than 33 inches from the ground, with the exception of Type 11 vehicles. All floor areas shall withstand a distributed load of 150 pounds per square foot. All floors shall be insulated against outside heat and cold. The floor of Type 1 and 3 patient compartment shall be:

1) of sheet metal minimum 20 guage and reinforced with 1/2 inch five ply water resistant plywood

OR

2) marine grade plywood not less than 3/4 inch thick, both supported by body framework

Voids and pockets shall be filled with sealer or caulking compound. Flooring shall extend the full working length and width of the patient compartment

4.12 Floor Covering

The floor covering shall be seamless, one piece, no wax type linoleum, vinyl or poured type of epoxy not less than 1/16 inch thick. Where the covering and sidewalls meet it shall be sealed, and in exposed areas bordered with corrosion resistant cover moulding, or the covering shall extend at least three (3) inches up the side walls

Note: Seamless vinyl sheet flooring should be of a type similar but not less than .090 thick commercial grade quality

4.13 Rear Floor Scuff Plate(s)

At least four inches in width across rear door, stretcher entrance

4.14 Doors

Two door openings, other than the driver compartment doors

shall be provided. There shall be a door(s) opening on the right forward side and rear for loading (patients on cots) into the patient compartment. Rear loading door(s) shall provide no less than 46 inches in height and 44 inches in width. A "door open" warning device shall signal in the cab when doors are not closed. Each door shall have seals to prevent leakage of dust, water, and air

4.15 Door Latches, Hinges and Hardware

Inside door handle shall be designed and placed so they cannot be operated (opened) when accidentally hit or used as a grab handle. All doors shall have hardware or devices to prevent inadvertent openings and closings

Stepwell - Steps shall be provided if the floor is more than 18 inches above the ground. Stepwells shall be lighted by interior lights

PARTITION

4.16 Type 1 and 111 Vehicles

A full height partition or bulkhead, having roll bar characteristics and an opening shall be placed between the driver and patient's compartment. This partition shall be located directly behind the driver and passenger seats when in the rearmost position. The partition opening shall be at least 17 inches wide and 46 inches high and provide an aisle between the compartments. Optional: a door with a viewing panel of safety glass of at least 150 square inches and with a self-latching device from the driver's side. Cabinets may also be added on the patient compartment side of the bulkhead

Type 11 Vehicles

The cab and body bulkhead shall have an aligned window opening of at least 150 square inches for visual check. The windows shall be of shatterproof glass, as per 5.10

4.17 Patient Compartment

Shall be sufficient in size to transport, accomodate and store all stretchers, cots and equipment required by these standards.

There shall be space for two patients and space around the patients to permit an attendant to administer treatment and proper care to at least one patient during transit. Patient compartment interior dimensional parameters a minimum of 8.49 cubic meters (300 cu. ft.). The length from the partition to inside of rear doors at least 294.64 cubic meters (116 in.) with a minimum of 76.2 cubic meters (30 in.) of space at the head of the primary cot. The width shall be a minimum of (12 in.) between the primary cot and squad bench. The height a minimum of 131.57 cm. (51.8 in.) from ceiling to floor

4.18 Patient Compartment Windows

Type 11 The patient compartment shall be provided with a minimum of 430 sq. inches (2,774.19 sq. c.m.) of window(s) right side of compartment only

Type 1 & 111 The patients compartment shall not have window except the viewing panel in the partition or bulkhead of Type 1 or in a sliding door if provided on Type 111

Type 1, 11, 111 All doors shall be provided with window. Window in rear doors shall be fixed and sealed without opening devices or hinges

All glass shall meet required C.S.A. standards and be privacy glass or masked on the inside with a smoked non-reflective film to reduce heat, glare and ensure privacy

4.19 Attendant Seating

The attendant shall have a seat available at the head of the primary patient near the bulkhead. The space under the seat may be designed as a storage compartment or utilized for other equipment. A set of safety belts shall be provided

4.20 Interior Storage Compartments and Cabinets

Shall provide a minimum volume of 30 cubic feet of enclosed storage cabinets, drawers, shall be easily opened, but shall not come open in transit. Drawers and swinging doors will be fitted with positive catches, and hinges will be continuous (piano type). Medical supply cabinets above the main cot shall have shatterproof transparent doors, and spring loaded hinges

that will lock in an open position. Storage compartment shall have adjustable sections and shelves, drawers, marine style slide or tilt and shall be removable. Cabinets shall be firmly anchored (bolted or welded to tapping plates of the body structure). Tops of cabinets and shelves shall be bordered or surrounded by a lip of not less than 1/2 inch (12.7 mm.) in height. The critical exposed edges of cabinets shall be protected with safety padding. A cove material shall be installed around the bottom exterior of all cabinets and benches and sealed to prevent water entering underneath cabinets

Storage shall be provided for, but not limited to the following items:

medicine dispensary
medical supplies
trash receptacle
oxygen tank (main)
radio equipment
heating and air conditioning
backboards
stretchers (folding and scoop)
switch panels and controls
miscellaneous storage, e.g. trauma kit, portable oxygen, et cetera

4.21 Squad Bench, Seats and Backrests

The Squad bench shall support the Model 9 and 107 C folding stretcher or combination stretcher chair. Squad bench platform shall be not less than 22 inches (55.88 cm.) wide, 76 inches (1.92 metres) and 14 to 19 inches (35.56 cm. to 48.26 cm.) measured from the floor to the top of the padded seat. Squad bench shall be provided with stretcher post cups and wheel cups, and provide underneath storage. Seats shall be of rubber or polyester, urethane foam, in covered fire retardant, washable, non-absorbent material. Three sets of safety belts for seated patients and for use in restraining stretchers when position on the squad bench

4.22 Seat Safety Belts and Anchorages

All seats shall comply with Canadian Safety Standard. Safety belts and anchorages shall have retractor devices for all seat positions in the vehicle including squad bench

4.23 Cot Fasteners and Anchorage

A crash stable, side or centre mounting style fastener of

quick release shall be provided for main wheeled cots. The cot fastener shall be bolted or attached to the main vehicle body and be able to withstand a force of 5 G's with a patient weight of 200 lb. (90.72 kilograms).

0 STORAGE AREAS

5.1 The oxygen compartment shall be provided with minimum space for a (M) cylinder in Type 11 vehicles and a (H) cylinder in Type 1 and 111 vehicles. A louvered device of a minimum of nine (9) inches, 22.86 cm located near the top of the compartment, permitting any leaking oxygen to dissipate/vent to the outside shall be provided. Oxygen cylinder storage area shall not be utilized for any other storage or equipment, and shall be free of electrical devices and wiring

5.2 Oxygen cylinder restraint device - Oxygen cylinders shall be mounted in a crash worthiness restraining device with a minimum of three ¼ inch 6.35 mm. by ½ inch 12.7 mm steel straps. The device shall be bolted or welded to the main body or frame of the vehicle and be able to sustain a force of 5 G's. The door of the oxygen storage cabinet shall have a shatterproof transparent window sliding or swinging to allow viewing and access of regulator and valve

5.3 Spare Tire and Storage - One inflated spare wheel/tire assembly identical to those on the vehicle shall be furnished (see 3.13). The spare assembly shall be stored in an accessible compartment or a rack, inside type 11 vehicle. This spare assembly shall be accessible without removal of the patient from the compartment. The spare assembly and tools shall have restraining devices to eliminate rattling or movement due to accident

5.4 Tools (Tire Changing)

Vehicle must be furnished with tools required for exchanging mounted tire assembly with the spare assembly and shall include at least a jack, jack handle, and wheel nut wrench. The jack must be adequate to permit safe removal and replacement of the wheel and tire assembly. Tools shall be stored in accordance with 5.3

5.5 Exterior Storage

Outside storage compartments shall be provided in the ambulance body for extrication and miscellaneous tools and equipment. Unless otherwise specified, spare tire and oxygen tank storage compartment shall be accessed from the outside, with the exception of type 11 and unless specified on type 1V vehicles. Exterior shall be rust resistant, hinges, locks and latches et cetera shall be as near to flush with the vehicles body as possible. All storage space shall be water and dust proof, and be rust resistant

5.6 IV Holders

Holders and strapping device to tie and control IV bags/ bottles shall be provided. The ceiling holders shall be located, one at the head of the primary cot and one at the head of the squad bench. Both shall be near flush to the ceiling

5.7 Location of Medical Equipment and Supplies

Location of equipment and supplies shall be dictated by their inportance and ready accessibility to the attendant

Equipment for airway management, oxygen, resuscitation and monitoring blood pressure shall be located where readily available from the attendant seat at the head of the main cot. Supplies, devices, tools, et cetera, shall be stored in enclosed compartments and drawers. All devices and equipment shall be stowed properly fastened, in/on the action area or cabinets, or fastened to a rail system to prevent items from moving about while the vehicle is in motion

Trauma kits, portable oxygen, portable suction, et cetera shall be stored where available to the attendant from the exterior door of the vehicle

6.0 ELECTRICAL SYSTEM AND LIGHTING

6.1 Electrical system and Components

The ambulance electrical system shall be equipped with, but not limited to the following

Generating, starting, lighting, ignition, visual and audible warning systems, identical dual 12 volt batteries, specified electronic equipment, and devices including master consoles located in the cab and patient compartment, and other specified accessory wiring. The electrical system and equipment, and other specified equipment shall comply with all Federal and Provincial Electrical Code regulations. All electrical and electronic components shall be selected to minimize electrical loads thereby not exceeding the vehicle's generating system capacity. All electrical system components and wiring shall be readily accessible through access panels. All exterior housings or lamps, electronic devices and fixtures shall be corrosion resistant and water proofed

6.2 Engine High-Idle R.P.M. Speed Control

Unless the chassis manufacturer's engine idle speed can sustain the ambulance in a stationary condition with total continuous electrical and heating/air condition load for 40 minutes at 95 deg. F. (ambient temp.), an engine high-idle speed control shall be provided which will manually increase the engine (R.P.M.)

6.3 Wiring Criteria

All wiring will be color coded and not less than 14 gauge (15 Amp.), with a 10 inch service loop of wire provided at all electrical components. All wiring between cab and module in Type 1 and 111 ambulances shall be connected to a terminal strip(s) or block(s) or quick disconnect couplers near the point of entry to the module. All terminals shall be permanently numbered or colour coded or both for checking and service. All systems shall incorporate a master circuit breaker panel with circuit breakers which comply to Federal standards in each circuit

6.4 Batteries

Batteries shall be located in a ventilated area, sealed off from occupant compartments and shall be readily accessible for servicing and removal

6.5 Battery Selector

The selector device shall be capable of selecting either battery separately or both batteries simultaneously. The switch or switches will also be capable of completely disconnecting both batteries. A diode isolator device shall be installed which permits simultaneous charging of both batteries and prevents the removal of the battery load from the alternator when the battery selector switch or device is placed in the OFF position with the engine running

6.6 Ammeter/Voltmeter

The electrical system shall incorporate a center scale ammeter which will indicate charging or discharging of the dual batteries

Voltmeter will also be installed when, in the opinion of the ambulance manufacturer, it is required

The ammeter and/or voltmeter will be illuminated for night time operation

6.7 Internal 12 Volt DC Power Outlets

Polarized 20 ampere capacity with 12 gauge wire, separately protected circuit with two outlets. This circuit shall also include a low voltage drop diode to isolate medical equipment batteries from any electrical loads that the ambulance electrical system may impose, as specified by purchasers, e.g. incubators, portable electric suction

6.8 Marking of Switchers, Indicators and Controls

All devices supplied by the ambulance manufacturer shall be clearly visible to the attendant. The identification shall be contrasting colors etched or engraved in plastic or mounted in illuminated panels on console. All switches shall have a light indicator to show the "on" position

6.9 115 Volt AC Utility Power

As required this system shall be installed by the ambulance manufacture or maybe retrofitted to the manufacturers specification and allowing for provincial electrical code standards

The system is to provide use for external powering of compartment heaters, engine block heaters. Battery charges and other built in devices that may be necessary to the purchaser.

6.10 Ambulance Emergency Lighting

The lighting system must provide the ambulance with 360 degrees of conspicuity for safety. The system should not impose an electrical load exceeding 40 amperes. The emergency warning light system shall contain six (6) red stationary lights (see 6.11)

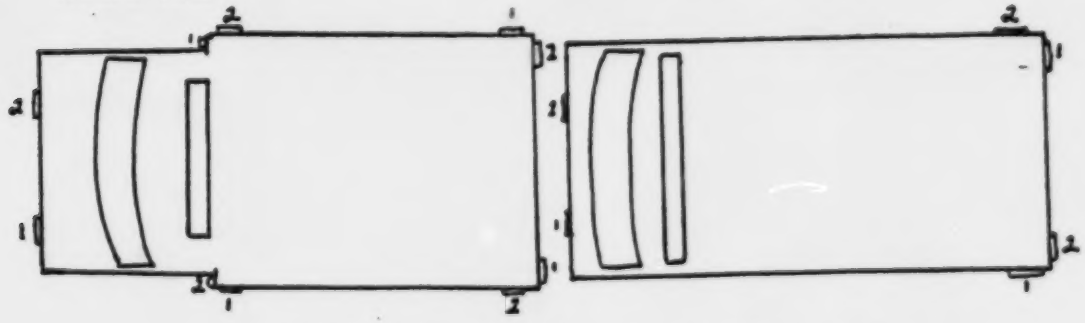
Type 1 and 111 and Raised roof Type 11 vehicles

The lights shall function in a dual mode flashing system (see 6.11 Illustration)
All upper body warning lights shall be identical and mounted at the extreme upper corner areas of the vehicle body below the horizontal roof line

Type 11 standard vehicles: The rear upper body warning lights shall be mounted above the horizontal roof line, so to remain visible when the rear doors are open (see 6.11 Illustration 2)

The red "grill" lights shall be located at least 28.5 inches above the ground, but below the bottom edge of the hood and be separated by at least 20 inches. The rotating beacon or light bar shall be mounted on the front area over the driver compartment

6.11 Type 1, 111 Illustration 1 Type 11 Illustration 2
TYPE 11
RAISED ROOF
STANDARD HEAD ROOM



1 - indicates lights flashing at the same time

2 - indicates lights flashing alternatively with No. 1

6.12 Exterior Flood Lighting

This lighting shall be not less than 70 inches above the ground and unobstructed by open doors. Floodlights shall be located on the left and right sides of the ambulance, and be firmly fastened to reinforced body surfaces below the roof line, except Type 2 vehicles, where they are to be mounted above the roof line. Floodlights shall be controlled independently on each side of the vehicle. Loading light(s) shall be automatically activated when rear door(s) are opened and may be incorporated with back-up lighting system (see 2.6)

6.13 Interior Lighting

The basic interior lighting shall be designed to give maximum lighting with a minimum electrical load

6.14 Driver Compartment Lighting

Will include factory manufacturer lighting package. Ambulance conversion shall include master switch panel, console lights with a chart light. Opional switches will be within easy normal reach of the driver

6.15 Patient Compartment Lighting

Lighting will include compartment and shelf space lighting where necessary and may include stepwell lighting. The control switches shall be mounted within normal reach of the attendant seat, and forward of the primary patient's head. Lighting over main cot shall cover at least 99 percent of cot surface area, providing 50 to 75 foot candles of illumination.

7.0 ENVIRONMENTAL SYSTEMS

All ambulances shall be equipped with heating, ventilating and air conditioning using recirculated and ambient air. The system(s) shall be able to maintain the interior temperature within a comfort zone of 20.0 C (68 deg. F.) to 25.4 deg. C (78 deg. F.)

Type 1 vehicle system shall provide a positive pressure with each closed compartment. The driver and patient

compartment environment shall be independently controlled

7.1 Hot Water Heater, shall have a minimum capacity of 20,000 B.T.U. per hour at 65.6 C (150 deg. F.) differential, and guaranteed to move 240 CFM of air with the fan in the high speed position

7.2 Fresh Air Intake, shall be located in the most practical, contaminant - free air space on the vehicle. The patient compartment may be ventilated through the environmental equipment (heater/air conditioner) or by a separate system

7.3 Power Exhaust Roof Vent - this vent shall be mounted in the roof on the centre line, approximately 40" from the rear for the type 11 vehicle. For type 1 and 111 vehicles the most practical roof area shall be used.

8.0 OXYGEN SYSTEMS

8.1 Oxygen - Hospital Type Piped System

The manufacturer shall install all component and accessories required for the piped system which shall include a reducing valve, pressure regulator, pre-set to 50 to 60 PSI line pressure, non-ferrous piping and low pressure hose approved and suitable for medical oxygen (see 5.1)

Oxygen piping shall be concealed, and not exposed to the elements or inadvertant damage. The main outlet station will be located no more than 36 inches (91.2 CM) from the center of the main cot. The second outlet will be adjacent to the head of the squad bench, using Ohio connectors

8.2 Oxygen System Tests

Prior to delivery the manufacturer shall test the O_2 system at 200 PSI pressure for eight hours. The system shall be tested with dry room air, and shall be tagged with date and signature of person and firm performing the test

8.3 Oxygen Pressure Regulator and Flowmeter

The reducing and regulating valve shall have an excess pressure relief valve set at 200 PSI maximum a gauge range of 0 to 2,500 PSI, the gauge scale graduated in not more than 100 PSI increments. The regulator shall be easy to connect and pre-set at 50 to 60 PSI line pressure permitting a maximum flow of 300 liters per minute. The flowmeter

shall have calibrated increments and shall be accurately readable from a distance of five (5) feet in normal ambulance lighting. These devices shall maintain accurate reading and calibration under ambulance operation, and unaffected by temperature conditions

8.4 Suction

Unless otherwise specified an electrically powered suction system shall be installed. All components, electrical, pressure, other lines and accessories shall be securely mounted and readily accessible. The equipment shall be mounted in the action area but clear of other equipment and controls. The system shall provide a free air flow of at least 30 LPM and achieve a minimum of 300 mm HG vacuum within four seconds after the suction tube is clamped closed. A vacuum control and shutoff valve, or combination shall be provided, a vacuum indicator gauge, with numerical markers at least every 100 mm Hg and a total range of 0 to 760. The collection bottle or bag and spare stored shall be nonbreakable and transparent with a minimum 1,000 ML capacity.

8.5 Portable Oxygen Suction And Resuscitation Systems

Space shall be provided so that the portable resuscitation equipment may be reached from outside the patient compartment.

9.0 COMMUNICATION

9.1 Antenna, Cable And Mounting

All ambulances shall be provided with a ground plate and opening, and coaxial lead-in wire from the radio storage area or compartment to a temporarily sealed antenna port on the patient compartment roof. The antenna port located in the patient compartment directly under the mounting area, shall have an opening provided, if not zipper type. All fiberglass roofs shall be equipped with at least a 40 x 40 inch (1 x 1 metre) metal ground plate molded into the roof. Ducts and snorkel shall be provided to pull cable when applicable. Approximately 3 feet (0.9 metres) extra cable at the radio end and 17 inches (0.4 metres) at the antenna base shall be provided

9.2 Intercom System

When required (as in Type 1 vehicles) an intercom system shall be provided. The driver shall have the capability to place the patient compartment in stand-by "talk" mode and control any necessary switching.

10.0 IDENTIFICATION

10.1 Interior Signs And Markings

Appropriate signs shall be fixed to the inside of the patient compartment doors stating "OPEN THIS DOOR FIRST" or similar wording to suit the inside latch mechanism

"NO SMOKING" signs shall be displayed in both patient and driver's compartment

Appropriate lights or decals shall identify the following:

1. Control switches, driver and patient compartment
2. Incubator plug(s)
3. 110 volt outlet
4. Circuit Breakers (panel - Function and size of Breakers)

10.2 Exterior Markings

"Ambulance" legend - 7" x 52¼" die-cut "scotchlite" series 580-14 orange sheeting - three legends per vehicle (rear plus one each side)

10.3 "Ambulance" reverse legend 7" x 52¼" die-cut "scotchlite" series 580-14 orange sheeting - one legend per vehicle (front)

10.4 Striping - 8" x vehicle length "scotchlite" series 580-14 orange sheeting. A space of 21" cut from the striping shall be provided in the two front cab doors for emblem or service name

10.5 Vehicle Identification Numbers (ie.: 422-01) 3" height x ½" stroke - three sets per vehicle (one each front corner and one right rear).

11.0 VEHICLE SAFETY

11.1 Pre-delivery Roadtest

The vehicle loaded to the G.V.W.R., shall be road tested for a minimum of 50 kilometer on paved highway at highway speed, and on gravel or dirt roads at speeds of 60 km/hr. for not less than 20 kilometers

11.2 Water Spray Test

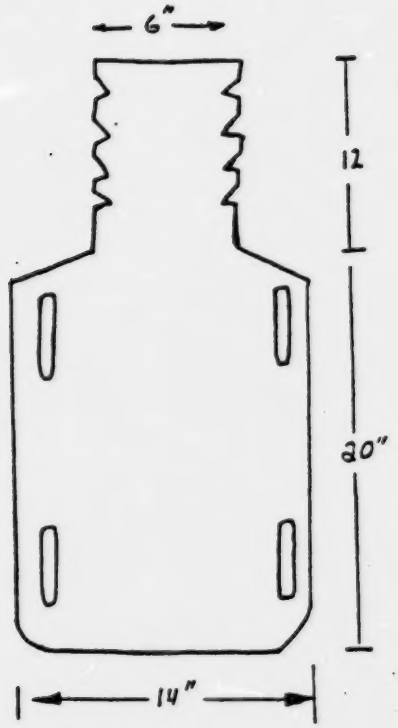
Following the road test, the ambulance shall be subjected to a water spray test of 15 minutes. The spray shall be delivered by nozzles operating at 1.88 kilograms per square centimeter water pressure. Evidence of water leakage shall be cause for rejection until leak is corrected.

12.0 ACCESSORY EQUIPMENT

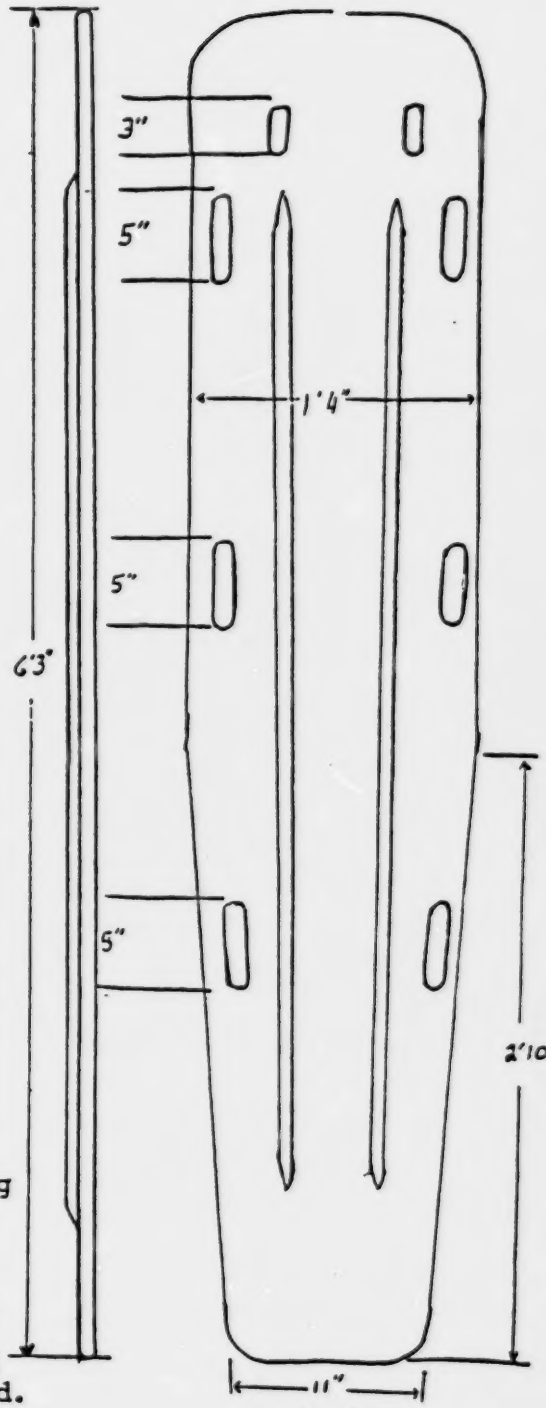
	Item	Number Required	Specifications
12.1	tow chain	1	15 ft. (4.57 m) drag link at both ends
12.2	flares	6	red, fusee-type 20 minutes
12.3	spade	1	folding backpac type (army)
12.4	pry bar pry	1	minimum 48" (120 cm) chisel end
12.5	crow bar	1	minimum 36" (90cm)
12.6	portable hand lights	2	battery operated
12.7	fire extinguisher	1	rated 10 lb. A.B.C. type
12.8	hardhats	2	C.S.A. approved
12.9	reflective vests	2	C.S.A. approved
12.10	safety retaining straps	4	6' (1.80 m) Commission approved - thread through buckles

PATIENT CARE EQUIPMENT AND SUPPLIES

m	Type	Minimum Number Required	Specifications
.	Main cot, either (a) Model 30 or (b) Model 29 or (c) Model 26	1	Ferno-Washington or equivalent all cots shall be equipped with two safety retaining straps, approved by the Commission
.	Folding stretcher, either (a) Model 9 or (b) Model 107C	1	Ferno-Washington or equivalent with elevating head and two safety straps, and thread through buckles
.	Orthopaedic stretcher	1	Model 65 scoop stretcher or equivalent with three safety straps with thread through buckles
.	Long fracture board	1	6' (1.80 m) 16" (40 cm) wide see diagram
.	Spinal immobilization device	1	capable of immobilizing a sitting patient firmly and prevents rotational, lateral extension and flexion movement of the spine. X-ray translucent-visible, but not obstructive. Simplistic design permits application by two trained persons in less than three mins.
.	Safety straps	2	9 ft. (2.70 m) complete with thread through buckles
.	Blankets	4	natural and/or man-made fibres
.	Sheets	4	Linen or equivalent
.	Sheets	2	plastic or equivalent
.	Pillows	2	hypoallergenic
.	Pillow cases	4	linen
.	Towels	4	terrycloth
.	Pillow cases	2	plastic or equivalent
.	I.V. pole	1	adjustable, clamp on type



Short Board



Back View
Long Board

The boards are made from 3/4 inch marine plywood finished on both sides. Both surfaces are radio-opaque, well sanded, varnished, and waxed.

Each board is equipped with two straps made of belting 2 inches wide and 8 feet long and equipped with a friction buckle.

A. Handholds, which can also double as strap holes, measure 5 by 1 1/4 inches and are 1 1/4 inches from the edge of the board. Handhold edge is rounded.

B. Strap holes measure 1/2 by 3 inches and are 3/4 of an inch from the edge of the board.

C. One-inch half/rounds with tapered ends elevate the long board so that bearers can insert fingers through the handholds. Tapered ends of half/rounds prevent board from catching as it is pushed under the patient.

D. Both ends of the long board and the bottom end of the short board are tapered so that the boards will slide as easily as possible when pushed under or behind the patient.

tem	Type	Number Required	Specifications
1.	Triangular bandages	18	cloth, non-sterile, with safety pins. Each shall measure 36" x 36" x 48"
2.	Pressure dressings	10	shall be highly absorbent, non-stick dressing. Shall be of a commercially made type or locally made to a custom design (ie. gauze sponge and roller bandage). Custom made pressure dressings shall be individually wrapped and sterilized
3.	Kling or Kerlix	24	roll bandage, non-sterile 12-4" x 5 yds bandage of the similar consistance, design may also be used
4.	Sponges	50	4 x 4 - 4 ply gauze (individually packaged)
5.	Band-Aid	50	strips 3/4" x 3". Polyvinyl or similar quality that are air vented. The gauze pad to be absorbent. The wrapper shall maintain sterility
6.	Tapes	2	1" adhesive (standard porous cloth type)
7.	Eye dressings	6	shall be an oval shaped cotton and gauze. Sterilized and individually wrapped
8.	Scissors	2	shall be of a design that will cut through a variety of materials: seatbelts, canvas, heavy outer clothing boots, zippers, etc. Shall be blunt ended like bandage scissors with serrated cutting edges. Shall be of stainless steel. Shall be light and compact
9.	O.B. kit	1	shall contain everything necessary for an unscheduled, normal childbirth. The kit shall contain sterile gloves, umbilical clamps, scalpel, O.B. pads, 4" x 4" gauze sponges, placenta bag, receiving blanket, drape sheet, disposable towels

Item	Type	Number Required	Specifications
10.	Burn bundle	1	locally made. Cotton shee linen sheets: 2 - full size 2 - half size 4 - quarter size 4 - eighth size Individually wrapped, ster 2 litres of sterile normal saline. Stored in a well container showing expiry d
		OR	
	Burn sheets	1 set	linen-burn sheets shall be packaged. Sterile and des for use when large areas o body are burned. Sterilit be guaranteed, expiry date Local or commercially purc acceptable
11.	Tissue	2 boxes	Kleenex type. 2 ply stand size - white
12.	Kidney basins	2	8" plastic

Item	Type	Minimum Number Required	Specifications
13.	Oxygen equipment (a) O_2 cylinder	1	Minimum capacity 3,453 litres (M or S type)
		2	Minimum capacity 352 litres (D type)
	(b) regulator	2	single stage, LPM2-15, high pressure gauge O - 3000 inlet pressure both gauges 2" minimum
		OR	
			wall mounted type may use flow-tube, calibrated @ 1-15 LPM. Design must be approved by the Commission
	(c) masks	2	clear simple type with tubing-adult
		2	clear re-breath type with tubing-adult
		2	clear non-rebreath type with tubing adult
	(d) cannulas	2	
	(e) oropharyngeal airways	2	child 7 cm
		2	small adult 8 cm
		2	medium adult 9 cm
		2	large adult 10 cm
14.	Ventilator bag-valve-mask device	1	a patient valve which has a 15 mm/22 mm fitting for masks, EOA/EGTA, or endotracheal tube, and an intake valve which has fittings for supplemental oxygen and a reservoir device. The bag-valve-mask device shall: 1. maintain a seal between the device and the patient's face 2. provide an immediate means of ventilatory support 3. convey a sense of compliance of the patient's lungs 4. can be used with spontaneously breathing patients
15.	Portable O_2	1	minimum capacity 352 litres (D type cylinder). Single stage non-gravity litre flow showing LPM2-15 and a high pressure gauge O-3000 inlet pressure. Shall be stored in a safe carrying device, sturdy to ensuring adequate safety during transport. All carrying devices shall be Commission approved

Item	Type	Minimum Number Required	Specifications
16.	Suction apparatus	1	Electric operated, vehicle mounted, as per 10.4 of schedule A
		1	Portable system. Shall provide a high flow and vacuum of 11" mercury (300 MMH9). Free air flow, a minimum of 25 litres a minute
	(a) suction hose	1	4 ft. length of latex rubber tubing 3/16" by 1/16 wall
	(b) tonsil tip	2	shall be clear, shatter proof
	(c) suction catheter	2 ea.	#10 French, #14 French
17.	Trauma kit	1	dust and moisture proof container; (The following items to be standard with those stocked in the vehicle.)
		1 set	oropharyngeal airway
		8	pressure dressings 4 large (6") 4 small (4")
		12	4" x 4" gauze (sterile)
		4	4" Kling bandage or equivalent
		10	triangular bandages
		1	1" adhesive tape
		1	penlight
		1 pair	scissors (shear type)

Appendix B

Specification - Multi-Purpose Vehicle for Integrated Service

SPECIFICATION
MULTI-PURPOSE VEHICLE FOR INTEGRATED SERVICE

September 1985

Prepared For

Transportation Development Centre
Transport Canada

By

T E S Limited

Ottawa, Canada

T E S File Number: C584-3

SPECIFICATION

Introduction:

This specification covers the requirements for a vehicle capable of being operated as a transport for ambulatory passengers or passengers in wheelchairs or stretchers. It is intended that the vehicle be based on an existing design of wheelchair lift equipped van with modifications to incorporate the required seats, wheelchair restraints, and stretcher support equipment.

Five seats are to be provided for ambulatory passengers. Of these seats, four are removeable and are capable of being replaced by three wheelchair restraints or one stretcher position, as required by the user. The stretcher support equipment (oxygen, medical kits) will be carried only when the vehicle is in use as a stretcher transporter.

The vehicle will be operated in rural areas for long distances over all types of road surfaces throughout the year. The use of the vehicle should not require any specialized skills on the part of the operator.

General Requirements:

The complete vehicle shall conform to the Canada Motor Vehicle Safety Standards in effect no earlier than the date of manufacture of the chassis cab and no later than the actual date of completion of the vehicle.

The complete vehicle shall conform to the Canadian Standards Association Standard CAN3-D409-M84 except as approved by purchaser. Where the standard is at variance with the Canada Motor Vehicle Safety Regulations, the Canada Motor Vehicle Safety Regulations shall pre-empt the CSA provisions that are at variance.

The complete vehicle shall comply with the Manitoba Highway Traffic Act (1979).

All the requirements of this specification must be complied with, to the satisfaction of the Purchaser. If there are any cases where this does not apply, please provide an itemized list and explanation of same.

If it is found after delivery that any requirements of the specification have not been met, the Supplier will be required to correct same at his expense.

The Supplier must understand and agree that any and all measures to secure warranty work and payments must be satisfied directly by the Supplier. The Purchaser shall not be required to deal with a third party.

At time of delivery, the Supplier shall supply to the Purchaser, 1 copy of the latest issue of both the Maintenance and Operators Manual covering the vehicle being delivered, including features added by the supplier.

Vehicle Chassis

Alternator

- Heavy duty minimum 100 A in accordance with SAE Recommended Practice J544.

Battery

- 2 - 550 A in parallel
- Vehicles shall be equipped with a selector device capable of selecting either battery separately or both batteries simultaneously. The switch or switches will also be capable of completely disconnecting both batteries. A diode isolator device shall be installed which permits simultaneously charging of both batteries and prevents the removal of the battery load from the alternator when the battery selector switch or device is placed in the OFF position with the engine running.
- Installed in a readily accessible location in engine compartment, completely unexposed to road hazards.
- All battery compartments shall be vented to provide adequate ventilation.

Block Heater

- Two heaters, installed in each side of engine block.
- Electrical wiring to terminate in a motor home type junction mounted on or above front bumper.

Brakes

- Power assist as recommended by the chassis manufacturer.
- Each brake drum or rotor shall be permanently marked in legible cast or stamped legend to clearly indicate the maximum safe inside diameter of the drum or the minimum safe thickness of the rotor beyond which it should not be used.
- The brake lines and booster assist lines shall be protected from

excessive heat and vibration and be so installed as to prevent chafing.

Bumpers

Front

- The bumper shall extend beyond the forward most part of the body and to the outer edge of the front sheet metal to assure maximum fender and body protection.
- The bumper, except breakaway bumper ends, shall be of sufficient strength to permit pushing another equivalent vehicle of equal gross weight on level ground at rated GVW without major permanent distortion to bumper, chassis or body.

Rear

- A rear bumper(s) shall be furnished and attached directly to the chassis frame with provisions for removal. It shall extend beyond the rearmost part of the body surface at least 25 mm (1 in) measured at the floor line. It shall be of sufficient strength to permit the bus to be pushed by another vehicle without major permanent distortion when being pushed on level ground at rated GVW.
- There shall be a full-width step provided in the rear bumper for rear door entry.

Cooling System

- The largest available radiator and fan for the selected engine shall be supplied. The fan shall be thermostatically controlled so as to be effectively power driven only as required to maintain recommended engine temperature, with an ambient temperature of $38^{o}C$ and all accessories operating.
- Coolant provided shall be permanent antifreeze with rust inhibitor, to provide freeze protection to $-35^{o}C$.

Engine

- V8 of not less than 350 cubic inches capacity.
- Shall be capable of using regular grade gasoline.

- When loaded to the GVW the vehicle shall be capable of ascending and descending not less than 40% grade and be able to stop and restart while on the grade.
- Provide acceleration time of 8 to 11 seconds from standing start to 65 km/h when fully laden.

Exhaust System

- The exhaust pipe, muffler, and tail pipe shall be outside the passenger compartment and attached to the chassis, except that the last tail pipe hanger may be attached to the body.
- The exhaust shall discharge at the left side of the body away from any door(s) to minimize fumes and contaminants entering the interior.
- Adequate clearances or heat protection shall be provided between the exhaust system and fuel tanks, fuel lines, flexible brake lines and hoses, and other flammable material.

Frame

- Modifications of frame lengths by other than chassis manufacturers, which result in the altering of the wheelbase, are not permissible unless modifications are approved by the chassis manufacturer.
- Holes in top or bottom flanges of the frame side rails shall not be permitted except as provided in the original chassis frame.

Fuel Range and System

- The vehicle shall be capable of operating for at least 400 kilometers (250 miles) under winter conditions over secondary roads without refuelling.
- The fill-pipe cap shall be entirely outside the passenger compartment and be equipped with security locks.
- Each tank shall have a dash mounted fuel gauge to permit fuel reading for each tank.

Gross Vehicle Weight

- The gross axle and gross vehicle weights of the loaded vehicle shall not exceed the manufacturer's statement of compliance for gross axle and vehicle weight ratings.
- In determining the gross vehicle weight, the total maximum passenger weights shall be based on the following (a) 64 kg (150 lbs) for the driver, (b) 64 kg (150 lbs) for each passenger not in a wheelchair, and (c) 120 kg (250 lb) for each wheelchair position.

Horn

- Two suitable electric horns shall be provided and they shall comply with SAE Standard J377.

Instrument Panel

- Shall be equipped with a complete set of instruments including:
  - speedometer
  - odometer
  - voltmeter or ammeter
  - oil pressure gauge
  - fuel gauge(s)
  - electric digital clock
- All instruments shall be accessible for maintenance and repair.
- The above mentioned instruments, gauges, and indicators except audible indicators shall be mounted on the instrument panel in such a manner that each is clearly visible to the driver in the normal seated position.

Rear Axle Ratio

- Optional as specified by chassis manufacturer

Steering

- Power steering

Steering Wheel

- There shall be a clearance of at least 50 mm (2 in) between the steering wheel rim and cowl, instrument panel, windshield, or any other surface.

Tires and Rims

- Tires shall be steel belted radials
- Maximum size of tires shall be 9.50 x 16.5 in.
- The rims shall be heavy duty type suitable for radial tires.
- A full size spare tire and rim shall be provided and mounted in an accessible location.

Transmission

- 3 speed heavy duty automatic with transmission cooler.

Wheel Wrench and Jack

- One wheel wrench and one jack of suitable size.

Undercoating

- The entire underside of the vehicle body including floor sections, cross members and below floor line side panels shoud be coated with a non-flammable wax-type material. Automotive tar or pitch quality undercoating is not satisfactory.

Shock Absorbers and Suspension

- Shock absorbers, double acting type, heavy duty, front stabilizer bar, as offered by manufacturer.

- Suspension components shall have a rated capacity in excess of the load imposed on each member, and shall be heavy duty but arranged to allow a very soft smooth ride.

Vehicle Body Specifications

Ambulatory Entrance

- There shall be an ambulatory entrance with double leaf doors on the right side of the vehicle.
- The ambulatory entrance door(s) shall be powered or manually operated. The locking and unlocking of the door shall be under control of the driver from his normal seated position. When the hand lever is used, no parts shall come together so as to shear or crush fingers. Power operated doors shall permit manual operation in case of power failure.
- The door(s) shall be shall be provided with (a) a means to secure it against unintended closing during loading or unloading of passengers; and (b) a safety latch on the ambulatory door to prevent unattended closing if the door grab handles are used.
- The minimum horizontal dimension of the door entrance shall be 762 mm (30 in) and a vertical opening of at least 1980 mm (78 in) in height.
- Vertical closing edges of a split or jackknife type door shall be equipped with flexible material to minimize the possibility of injury to fingers.
- There shall be a drip moulding above each door opening, to direct water to either side of the opening.
- A grab rail shall be installed along one side of the ambulatory entrance steps. The grab rail shall be capable of withstanding a pull of at least 450 N (100 lbf) in any direction without permanent deformation.

Body, General Construction

- The body shall be of prime commercial quality metal or other such equivalent strength material.
- All metal used in construction of the vehicle body should be zinc coated or treated by a process that offers equivalent protection before the body is constructed.

Communications

- Vehicle shall be prewired to accept a two-way 32 channel mobile radio with private dispatch and radio/telephone capabilities.

- The mobile radio shall be capable of operating under the most adverse conditions and shall be mounted in a suitable location accessible to the driver.
- A two-way radio antenna shall be prewired.
- The vehicle shall be equipped with an AM-FM stereo with cassette tape player, speakers in passenger compartment.

Driver Compartment

- Shall be furnished with an individual bucket-type seat. The seat shall be frame constructed for maximum riding comfort. Covering shall be fire retardent, washable and non-absorbent material. The driver's seat shall be adjustable to a minimum of four inches forward or rearward.
- Driver's seat shall be equipped with retractable seat belts and anchorages which comply with CMVSS.

Drivers Partition

- A partition shall be provided behind the driver's seat. This partition shall extend the full width of the seat and from above the seat to the floor. Partition may be fixed or removeable. Covering shall be fire-retardent, washable and non-absorbent material.

Emergency Exits

- Two outward opening door shall be provided at the rear of the vehicle to be an emergency exit with the opening wide enough to permit the passage of an 815 mm (32 in) wide wheelchair and shall comply with CMVSS 217 as it pertains to buses.
- Emergency exit doors shall be provided with a means to secure them against unintended closing during unloading of passengers.
- Fastening of any passenger restraining or wheelchair securement device to exit doors is prohibited.
- Emergency exits shall be clearly identified from inside and outside the

vehicle in English and French.

Floors

- The floor in the passenger carrying area shall have an overlay of at least a 13 mm (1/2 in) covering of 5-ply plywood, which equals or exceeds the properties of select sheeting C improved for underlay of CSA Standard 0121. The plywood flooring shall be securely fastened to the structure. Other forms of durable hardwood covering of commensurate strength and insulating properties may be used. Chipboard and loose composite board shall not be permitted.
- The static coefficient of friction of the flooring material when measured in accordance with ASTM Standard D2047, under wet and dry conditions, shall be a minimum of 0.5.
- The floor shall be designed to support a load of 240 kg (500 lb) at any wheelchair position without permanent deformation.
- The plywood shall be covered with heavy duty light coloured linoleum throughout.

Glass

- All glass shall conform with CMVSS.
- All glass in doors and windows shall be tempered or double laminated safety glass.
- All glass should be tinted, except the windshield.

Heating and Ventilation and Air Conditioning

- All vehicles shall be equipped with heating, ventilating and air conditioning systems using recirculated and ambient air.
- All vehicles shall be equipped with one front heavy duty heater.
- All vehicles shall be equipped with a heater of at least 25,000 BTU/hr capacity in the area by the ambulance attendant's seat.
- The heating system shall be capable of maintaining the inside air temperature at a minimum of 16°C (60°F) at -18°C (0°F) with the engine idling and the ambient air velocity at a maximum of 5 km/h (3 mph). The

temperature shall be measured at 400 to 450 mm (16 to 18 in) above the floor level at the centre of the vehicle.

- An adjustable cut-off heater valve shall be located within the cab. Cut-off heater valves shall have same capacity as heater fluid line. Heater lines shall comply with the following requirements: (a) they shall be supported to guard against chafing due to vibration; (b) the lines shall not dangle or rub against the chassis or sharp edges and shall not interfere with or restrict the operation of any engine function; (c) where hoses are used, they shall conform to SAE Standard J20; and (d) heater lines inside the passenger compartment shall be shielded to prevent scalding the driver or passengers and to provide protection in case of lines bursting.
- Each hot water heater system shall include shut-off valves installed in the pressure and return lines at the engine.
- Vehicles shall be equipped with at least one static type exhaust ventilator.
- An air conditioning system shall be provided for both the drivers and passengers areas. The system shall be capable of cooling the vehicle interior to a temperature $10^{o}C$ cooler than the exterior conditions of temperature and humidity up to $30^{o}C$ and 100% relative humidity, and to maintain that temperature during operation with varying engine speed.

Identification

(a) - The vehicle shall be identified by an accessibility symbol, on the rear left of centre, right front and body sides just behind the driver's station. - The symbol shall comply with the following:
  (a) A minimum size of 150 x 150 mm (6 x 6 in);
  (b) The symbol shall be white on a blue background with the following colour numbers as specified in CGSB Standard 1-GP-12c:
  White - 513-301 Blue - 52-104

(b) Lettering - (DO NOT PARK WITHIN 3 METRES OF THIS SIDE) - shall be painted on the lift side of the vehicle. The wording specified above in (b) shall be:
  (a) a minimum of 25 mm (1 in) in height;
  (b) in English, French or French and English;

(c) in a colour that contrasts with the background; and
(d) readily visible.

Inside Height

- The inside body height shall be a nominal 1830 mm (72 in) or more, measured metal-to-metal, at any point on the longitudinal centre line from the front vertical bow to the rear vertical bow.

Insulation

- The entire body including the floor of the passengers compartment shall be insulated to ensure normal satisfactory performance in ambient temperatures of $-40^{o}C$ to $+40^{o}C$.
- All insulating materials used for the reduction of heat transfer shall have a "R" value of at least 3.0 and shall be nonsettling, mildew proof and fire retardent.

Lighting

- Vehicles shall be equipped with:
  (a) A light at the exterior of the lift door automatically operated when the door opens which will illuminate the lift area;
  (b) A light above or beside each passenger access door including rear doors to illuminate the step nosings. Such light shall be automatically actuated when the door opens.
  (c) Driver controlled interior lights with individual shut offs.
  (d) Passenger area shall be equipped with suitable dome lights.
- Exterior lighting to conform to applicable CMVSS's and Manitoba Highway Traffic Act.

Passenger Seating and Seats

- The distance from the front of each seat back to the back of the seat ahead, measured on a horizontal plane at the centre of the seat cushion surface, shall be a minimum of 685 mm (27.0 in).
- The minimum rump width (space per person) shall be 508 mm (20 in).
- The height of a seat cushion above the floor shall be between 400 and

480 mm (16 and 19 in).

- The depth of the seat (front to back) shall be between 380 and 430 mm (15 and 17 in).
- Seats shall be level or slope downwards towards the back.

- Seat backs shall be a minimum of 380 mm (15 in) in height.
- The passageway required for movement of wheelchairs shall be a minimum clear width of 760 (30 in) between fixed objects.
- For each designated ambulatory seat, there shall be an occupant restraint system which conforms with applicable CMVSS's.
- All seats except escort's seat shall be capable of easy removal without tools leaving no projections on floor.

Seat Type and Arrangement

- Deluxe, highback seats.
- Equipped with removable or fold-away armrests.
- Offer good lumbar support for comfortable long distance travel.
- All material to be fire retardent, washable and non-absorbent.
- Accommodation shall be provided for five ambulatory passengers in individual seats.

Projections and Padding

- The interior of the vehicle shall be free from any sharp projections likely to be contacted by the passengers.
- The following shall be padded:
  (a) Stanchions;
  (b) Grab bars/handles, except those at the vehicle entrance;
  (c) Guard rails;
  (d) Roll bars;
  (e) Above rear emergency exit;
  (f) Exposed stationary parts of lifts and ramps which could be contacted by passengers.
- Padding shall be a closed-cell urethane foam, rubber or vinyl type of material a minimum of 5 mm (3/16 in) thick.

Rear View Mirrors

- Rearview mirrors shall be located inside and outside of the vehicle and shall conform to the following:
  (a) The interior mirror shall:
    - Have rounded corners and edges and be designed to reduce danger of injury upon impact;
    - Afford the driver a good view of the passengers;
    - Not unduly restrict the driver's forward visibility;
  (b) Outside mirrors shall:
    - Be located on each side of the vehicle forward of the driver's seat and the reflecting surface shall not be obscured by the corner pillar;
    - Each have not less than 322 cm^2 (50 in^2) of reflecting surface;
    - Have adjustable mounts;
    - Not unduly restrict visibility through the driver's right and left side windows;
    - A convex mirror shall be mounted adjacent to the flat surfaced, outside rearview mirror on the right side to provide an additional close-in field of vision. The radius of curvature of the mirror shall be between 300 and 890 mm (12 and 35 in).

Roof

- Extended roof shall have the roof structural members permanently fastened to structural members of the body (welded, bolted and sealed) to prevent separation in an accident.

- Vehicle shall comply with CMVSS 220 (Rollover Protection).

Safety

- All components and materials used on the interior of the vehicles must satisfy standards outlined in Canadian Motor Vehicles Safety Standard 302.

Safety Equipment

- The vehicle shall be equipped with at least one 5 kg (10 lb) or two 2.5 kg (5 lb) capacity dry chemical type fire extinguishers mounted in the extinguisher manufacturer's bracket of the automotive type, and one shall be in a location readily accessible to the driver. If a fire extinguisher is not in view (such as in an enclosed compartment), its location shall be plainly marked.
- The fire extinguisher shall bear the label of a recognized testing agency, showing a rating of not less than 2-A:10 B:C.
- The fire extinguisher shall be equipped with a pressure gauge which will indicate the condition of the extinguisher.
- The vehicle shall carry a first aid kit which complies with the Workman's Compensation Act, as set out under section 24(14) and the contents of the kit shall be as indicated in Manitoba Regulation W200-R3, Sections 17(1), (2) and (3).
- The first aid kit shall be mounted in a location readily accessible to the driver. If the first aid kit is not in view (such as in an enclosed compartment) its location shall be plainly marked.
- The vehicle shall carry at least three advance warning devices, such as red electrical lanterns or triangular relfex reflectors, conforming to CSA standard D171 or FMVSS 125.

Steps

- There shall be a yellow or white strip 50 to 75 mm wide on the leading edge of the horizontal surface of each step and the floor surface on the step entrance.
- The static coefficient of friction of step covering material when measured in accordance with ASTM Standard D2047, under wet and dry conditions, shall be a minimum of 0.5.
- Dimensions of steps at the ambulatory entrance shall be as follows:
  (a) Height of first step from ground level - maximum 330 mm (13 in);
  - minimum 225 mm (9 in);
  (b) Height of steps in the vehicle - maximum 200 mm (8 in);
  (c) Variation in height of steps in vehicle - maximum 25 mm (1 in);
  (d) Depth of steps (front to back) - minimum 215 (8-1/2 in);
  (e) Width of steps (side to side) - minimum 400 mm (16 in).

- Except for auxiliary steps, all steps shall be constant depth.
- The step nosings (overhang) shall not exceed 10 mm (3/8 in).
- The nosing at the floor level shall be flush with the floor.

Sun Visor

- Interior adjustable sun visors required and shall be not less than 150 x 760 mm (6 x 30 in).
- They shall be adequately supported to prevent excessive vibration.

Windows

- The vehicle shall be provided with windows on both sides of the passenger compartment which are capable of being opened.

Windshield

- Tinted safety glass which conforms with CMVSS.

Wiring

- All wiring shall comply with the current standards of the Society of Automotive Engineers.
- Wiring shall be arranged in circuits so as to be compatible with the chassis wiring and shall not be less than 14 gauge with a 10 inch service loop of wire provided at all electrical components.
- Each body circuit shall be coded by number, letter or colour.
- A separate fuse or circuit breaker which complies to federal standards shall be provided for each circuit, except starter motor and ignition circuits, and shall be located so as to be easily accessible.
- All wires within the body shall be insulated and, where accessible to the passengers, shall be covered with a protective loom (or equivalent) which will protect them from external damage and minimize dangers from short circuits. Grommets shall be provided for wires which pass through a body member.
- Wires which cannot be enclosed within the body shall be fastened securely. All joints shall be soldered or joined by equally effective connectors.

Wheelchair Accommodation Specifications

Wheelchair Seating and Arrangement

- Shall be forward facing.
- Accommodation shall be provided for three wheelchairs and occupants on the driver's side of the vehicle.

Wheelchair Securement

- Every wheelchair position shall be provided with a wheelchair securement device that conforms to the strength requirements specified in CMVSS 207. For the purposes of this test, the wheelchair weight shall be taken as 45 kg (100 lb). Where the wheelchair securement device and the occupant restraint device (see Clause 7.3) are combined in a common system, those parts which provide the combined restraining force shall have a combined strength according to the strength requirements specified in CMVSS 207 and 209.
- The wheelchair securement device(s) shall be designed to limit the forward and backward rotational, lateral, or vertical motion of all occupied for unoccupied wheelchairs and be of such design to prevent accidental disengagement.

Wheelchair Occupant Restraint

- For every wheelchair position there shall be an occupant restraint system. The restraint system shall consist of at least a lap belt.
- The occupant restraint system components shall comply with the strength requirements of CMVSS 209.
- The anchorages for the occupant restraint system shall comply with the strength requirements in CMVSS 210, Belt Anchorages.

Grab Bars/Handles

- Grab bars/handles shall be provided.
  (a) at each seat used by a disabled person; and
  (b) at each side of the entrance used by disabled persons, accessible from ground level, and so arranged that they are inside the vehicle when

the doors are closed.

- The maximum diameter/width of grab bars/handles, including padding, shall be 75 mm (3 in).
- Grab bars/handles shall be capable of withstanding a pull of at least 450 N (100 lbf) in any direction without permanent deformation.

Reading Light

- Shall be directed so as to illuminate the area from the waist down.

Lift

- Lifts shall comply with all requirements of CSA Standard CAN3.D409-M84 Section 8.

Ramp

- Ramps shall comply with all requirements of CSA Standard CAN3.D409-M84 Section 9.

Stretcher Configuration

Attendant Seating

- The attendant shall have a swivel seat available opposite the head of the patient.
- The space under the seat may be designed as a storage compartment or utilized for other equipment.
- This seat shall also meet all requirements for a passenger seat.

Cot Fastener and Anchorage

- A floor mounting style quick release fastener shall be attached to the main vehicle body and be able to withstand a force of 5 G's with a patient weight of 200 lb (91 kg).
- Cot fastener shall be the equivalent of Ferno Washington Model 175-3 or equivalent as recommended for the cot.

Floor Plan, Cot Placement

- Accommodation shall be provided for one cot.
- The cot shall be aligned in the passenger compartment such that the head of the cot occupant is forward in the vehicle.
- The cot shall be located against the wall on the driver's side of the vehicle.
- The cot shall be Ferno Washington Model 26 or equivalent, complete with a mattress and a patient restraint system.
- A horizontal grab bar shall be mounted on the roof, parallel to the longitudinal axis of the vehicle and to the side of the cot to assist the escorts while tending to the cot occupant.

IV Holders

- Holders and strapping device to tie and control IV bags/bottles shall be provided.
- Ceiling holders shall be located over head and chest of cot occupant. The hooks shall be able to store flush to the ceiling when not in use.

Location of Medical Equipment and Supplies

- Location of equipment and supplies shall be dictated by their importance and ready accessibility to the attendant.
- Trauma kit and Flynn Mark III resuscitator should be stored where available to the attendant from the exterior door of the vehicle and may be fastened to the vehicle by quick release securement straps.

Rear Door Entrance

- The inside door handle shall be designed so that the doors cannot be opened accidently.

Rear Floor Scuff Plate(s)

- A plate, at least four inches in width shall be located on the floor along the rear door stretcher entrance.

Storage Areas

- Storage shall be provided exclusively for an M or two Q Oxygen tanks forward of the rear axle when required.
- The tank(s) shall be mounted in a crash worthy restraint device which shall be bolted or welded to the main frame of the vehicle and be able to sustain a force of 5 G's.
- Oxygen cylinder storage area shall be free of electrical devices and wiring.
- Provision shall be made for the storage of a Flynn Mark III resuscitator, and Trauma Kit.
- Necessary space for medical equipment and supplies to be located for ready accessibility to the escort.

Appendix C

Quotation for Construction of Vehicle

GIRARDIN

A. GIRARDIN INC.

33 Highridge Ct.
Cambridge, Ontario
Canada N1R 7L3
Tel.: (519) 622-0666
Telex: 069-59404

September 30, 1985

T.E.S. Ltd.
248 Sheffield Road
P.O. Box 9372
Ottawa, Ontario
K1G 3V1

Attention: Mr. D.A. Rolfe - P. Eng.

Dear Sir:

Reference: File C584-3

We thank you for the opportunity to quote our combination ambulance/handi-bus prepared for Transportation Development Centre - Transport Canada.

We have quoted as per your specification with the exeption of:

Tilt Wheel - Was not included because of delivery - this could take an additional 3 months

Gas Tanks - Quoted the standard Ford fuel tank, but an auxiliary tank could be added at local Ford dealer - approximate cost of $350.00 - again delivery from factor - additional 3 months

Double-leaf Entrance Door - Our standard is 24 x 82" even though tender called for a 30" wide

We trust this quotation meets with your approval.

Sincerely,

Garry Lafner

GL/dr

Enclosure

cc: Peter Funk, Crestline Coach Ltd.

A. GIRARDIN INC.

33 Highridge Ct.
Cambridge, Ontario
Canada N1R 7L3
Tel.: (519) 622-0666
Telex: 069-59404

Company Name: T.E.S. Ltd.

Address: 248 Sheffield Road, P.O. Box 9172

Town or City: Ottawa, Ontario

Postal Code: K1G 3V1

Phone: 613-741-9402

Contact: Mr. D.A. Rolfe - P. Eng.

Quotation #85-104

Date: September 30, 1985

File - C584-3

Chassis Specifications

Manufacturer:	Ford (1986)
Model:	E-350
Engine:	351 V/8 4 bbl
Fuel:	Gasoline
Tank Capacity:	18.2
Transmission:	Automatic C-6
G.V.W.R.:	9300 lbs.
Suspension:	Heavy duty I Beam
Tires:	Radials LT235/85 R-16E (all weather)
Wheelbase:	138 inches
Steering:	Power
Heater:	Front & rear - high output
Radiator:	Extra cooling
Engine Block Heater:	Dual 1200 amp.
Alternator:	100 amp.
Brakes:	Power - Front - disc Rear - drum c/w hydraulic booster
Rear Axle Ratio:	3.54
School Bus Package:	Includes - Heavy duty 470 amp. battery (cold cranking amps at 18°c) Bunded front door main glass Heavy duty front springs Comfort ride suspension Dual electric horns Gauges amp and oil

A. GIRARDIN INC.

Company Name: T.E.S. Ltd. Quotation #85-104

BODY - BANTAM 'HANDI-BUS'

Body Specifications

Headroom:	74 inches
Entrance:	Double-leaf 24" x 82"
Windows:	22" x 28" Split sash (opening 9" x 28") tinted
Service Door:	40" x 67" rear mounted (side)
Lift:	Collins Saf-t-lift model L301 - electric/hydraulic
Paint:	Interior - White Exterior - White
Mirrors:	Two side mounted 54 square inches Cross-over mirror right side, 6" x 16" interior rearview mirror (2) 8" convex attached to side mirrors
Floor Plan:	Beige anti-skid flooring (2) Grab rails at double-leaf entrance door (3) Q'Straint - wheelchair and occupant restraint system Interior reading lights Stanchion & modesty panel passenger side at entrance Stanchion & modesty panel drivers side (floor to ceiling - fully padded) (5) Seats in passenger area 20" wide - cloth c/w arm rests (4) are quick disconnect (1) is ambulance attendant seat to match & swivels (therefore no storage available underneath) (5) Seat belts (5) Grab rails (1) Drivers seat to match passenger seat swivel, reclining and seat belt
Miscelluneous:	Dual batteries Step bumper (rear) Locking gas cap Spare tire & rim to match mounted on right rear door c/w vinyl cover Undercoating (wax type) Drip rails (all doors) AM/FM/Cassette (4 speakers) Digital clock Rear door stops (positive hold open device) Front & rear air conditioning - shut off valves for rear Auxiliary heater located under hood Rear auxiliary heater approximutely 22,000 BTU (4) Large handicapped logo's (1) Dome light lcoated over rear doors

A. GIRARDIN INC.

Company Name: T.E.S. Ltd. Quotation #85-104

Miscellaneous (con't): (1) 5 lb. fire extinguisher
(1) Large first aid kit
Safety reflectors
Lettering 'Do not park within 3 metres of this side'
(2) Sides bi-lingual
Pre-wire to accept MCX-100
Motorola MXC-100 mobile telephone
Furno-Washington model 2 cot holder
Rear door scuff plate
Noll Plooard i.v. holders (flush to ceiling when not in use)

PRICE: $37,616.00

Federal sales tax exempt
Provincial sales tax (extra if applicable)
F.O.B.: Cambridge
Licence - extra
Terms: Net 30

OPTIONAL EQUIPMENT

The following equipment is Federal sales tax exempt and <u>add</u> to price except 64" headroom which is a <u>credit</u>.

Furno model 30 cot	$1,281.00
Furno 430 belts	65.00 per pair
Furno 360 mattress	110.00
Flynn Mark III Resuscitator	555.00
'M' Size oxygen tank	435.00
Regulator for above	128.00
Trauma kit 2072	78.00
Electric suction	263.00
Colour stripe	300.00
Lettering 2 sides 'Multi-Purpose Emergency Vehicle'	300.00
Credit 64" headroom	(780.00)

A. GIRARDIN INC.

Company Name: T.E.S. Ltd.

Quotation #85-104

Delivery to Winnipeg (Ford Secondary Freight but must be delivered to a Ford dealer 'collect')	435.00
24" x 36" dark bronze pwr window opens 11" from top	540.00
Motorola MCX-100 mobile telephone service c/w wide spaced dfe receiver	2,508.00

Garry Ladner

GL/dr

Enclosure

cc: Peter Funk - Crestline Coach Ltd.

GIRARDIN

A. GIRARDIN INC.

33 Highridge Ct.
Cambridge, Ontario
Canada N1R 7L3
Tel.: (519) 622-0666
Telex: 069-59404

October 29, 1985

T.E.S. Ltd.
P.O. Box 9372
248 Sheffield Road
Ottawa, Ontario
K1G 3V1

Attention: Mr. Dan Rolfe, P.Eng.

Dear Sir:

Reference: Multi-Purpose Rural Vehicle Quotation
File C584-3

This letter is a revision to the price we quoted on September 30, 1985 (Quotation #85-104) as per your request of October 16, 1985.

Price per quotation	$37,616.00	
1) Omit tilt steering - I quoted without tilt	(no change)	
2) Omit recline and swivel option on drivers seat	(95.00)	CREDIT
3) Ferno Washington Model 175-3 Cot fastener replaces model 2 - Model 175-3 ($362.00) - Model 2 ($334.00)	28.00	ADD
5) Horizontal grab rail	175.00	ADD
REVISED PRICE	$37,724.00	

A. GIRARDIN INC.

T.E.S. Ltd.

OPTIONAL EQUIPMENT

3) Ferno Washington Model 26 cot replaces model 30 (Model 30 - $1,281.00)	$1,565.00
Full width step bumper - No additional charge	N/C
Exhaust left side - No additional charge	N/C
Description of the two-way 32 channel mobile radio: Motorola Ltd. MXC 100 Mobile Telephone Service Wide spaced D.F.E. receiver This is all the information that I have but could get more from Motorola upon request	
Grommets for wiring three body (standard)	std.
Windows that open (standard)	std.
Attendants seat opposite the head of the patient (this was done as per original quote)	
Storage of oxygen tanks forward of rear axle is okay.	
Delivery - 12 weeks from receiving your purchase order	

We trust this quotation meets with your approval.

Sincerely,

Garry Gardner

GL/dr

Enclosure

Appendix D

Demonstration Plan - Multi-Purpose Vehicle for Integrated Service

SYPHER

DEMONSTRATION PLAN

MULTI-PURPOSE VEHICLE

FOR

INTEGRATED RURAL SERVICE

Prepared for TES

By SYPHER Consultants Inc.

October, 1985

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APPENDICES

Appendix A: Program Guidelines for the Program for Transportation of the Mobility Disadvantaged in Rural Manitoba

Appendix B: Provincial/Federal Information Requirements Handivan Program

I INTRODUCTION

The government of Manitoba has a grant program for the acquisition of ambulance services by municipalities in that province. In addition, a Program for the Transportation of the Mobility Disadvantaged in Rural Manitoba was established in 1981. This program was designed to assist communities that have taken the initiative in providing transportation services for handicapped persons in rural areas of the province. The program makes provision for grants to assist in defraying the cost of acquiring and operating equipment to provide transportation services for the handicapped. Three types of grants are available under this program:

(a) Start-up Grant ($6,000.00 max.)

This grant is to assist in the start-up of a new service and to defray operating costs during the initial operating period of the program;

(b) Capital Grant ($10,000.00 max.)

Grants are available to cover one-half the cost of a capital asset to a maximum of $10,000. This is provided only for the first vehicle and may be used for capital items only e.g. vehicle, radios, shelter, etc.;

(c) Operating Grant ($20,000.00 max.)

A grant is available from the province to cover 37½% of the ongoing costs of operation of transportation services to a maximum of $20,000.

The overiding condition upon which these grants are made is that one municipal government must take responsibility for and guarantee any ensuing financial shortfall. The program guidelines can be found at Appendix A.

The program has been working well since its inception, however, largely due to rising costs (a typical handivan has increased in price from $20,000 - $35,000 in the past several years), fewer communities, particularly the smaller ones are able to afford both ambulance and handivan services. Consequently they looked to purchase a vehicle which could be employed in a dual purpose role. As no vehicles met this requirement, the Manitoba government approached the Transportation Development Centre (TDC) of Transport Canada with a proposal to examine this requirement more closely.

TES was contracted by TDC to develop in consultation with the Manitoba Government the specifications, design, financial data and demonstration plan for this rural vehicle.

II OBJECTIVES OF DEMONSTRATION PLAN

A. Preamble

In developing a demonstration plan for the rural vehicle it is important to take into consideration the operating philosophy and approach employed by the Manitoba government in its existing related programs. Generally speaking, provincial responsibility has been viewed as that of providing funding, guidelines and assistance to communities in the application process for grants.

Within the guidelines, the government does not tell communities how to manage or spend their grant money. Communities are encouraged to learn from other communities with existing services, thus the impetus and remaining financial responsibility is placed squarely on the community. Consequently there exists little or no pattern with respect to the management and operation of ambulance and handivan services in the small communities throughout the province. Needs vary by community as do the logistics of operation. For example, dispatch services are run out of hospitals, old age homes, etc., and are sometimes shared with handivan dispatch services. Frequency of service and hours of operation vary from community to community. Some services have volunteer drivers, some contract the service. Some communities alternate driver responsibility to alternate churches on Sundays. Still other communities contract handivan services to the ambulance driver/dispatch to minimize overhead costs.

The purpose in recounting these varied approaches is to reinforce an understanding that in existing programs the approach reflects the philosophy that the community is in the best position to work out its own arrangements with respect to operation of the service. This philosophy will be taken into consideration in the development of a demonstration program for the multi-purpose vehicle.

B. Objectives

The overall objective of the demonstration program is to collect data which will enable an assessment to be made of:

(a) the feasibility of a combined handivan/ambulance in small rural communities;

(b) the technical performance of the vehicle; and

(c) the financial aspects of operation, e.g. cost to the community of the vehicle/service.

III THE DEMONSTRATION PLAN

In keeping with the approach embodied in the administration of existing related programs and funding mechanisms of the Goverment of Manitoba, the following demonstration plan outline is proposed. It has been developed in consultation with the Manager, Transportation Policy, Programs and Research Division of the Manitoba Department of Highways and Transportation. It is purposed that the demonstration program take place over a two year period in order to allow a meaningful amount of data to be collected for analysis. It is also proposed that the Transportation be given responsibility for supervising and collecting data collection for the program.

The demonstration plan is comprised of the following components:

1. Community Selection;

2. Operation Logistics;

3. Evaluation:
   (a) Technical/Service;
   (b) Use;
   (c) Financial.

1. Community Selection

The community of Minitonas was selected in consultation with the Government of Manitoba. Figure 1 illustrates the location of the village which is situated approximately 470 km northwest of Winnipeg and has a population of 610. The nearest settlement with a hospital and ambulance service is Swan River which lies approximately 30 km to the north. Of the population, approximately 30% are 65 years of age or older and 15 residents have been identified as mobility disadvantaged. Typical of many small settlements, Minitonas has a growing population of retired farmers and other persons who are classified as mobility disadvantaged particularly during winter. It is also typical of those villages that are not large enough to afford or justify an ambulance and handivan service despite the grants available. The community has been very active and has pursued with interest the opportunity of acquiring a handivan, particularly one which was dual purpose as the ambulance service from Swan River is considered very expensive. Thus Minitonas was recommended as the community most suited to demonstrate the rural vehicle.

2. Operation Logistics

In keeping with program guidelines of the Transportation of the Mobility Disadvantaged it is recommended that the community develop, in consultation with the Manager of the Transportation

Figure 1. Location of Minitonas, Manitoba

Policy, Programs and Research Division, the logistics of operation for the demonstration vehicle which best meets local nee and resources. The following areas will be addressed:

a) Vehicle Operation

From the experience gained in handivan operations in rural Manitoba three options are available to Minitonas. They are as follows:

(i) Service provided by full-time drivers.

Three communities employ full-time drivers to provide their service. In the Rural Municipality of Gimli a husband and wife team provide the services seven days a week. Selkirk has a very similar situation with a husband and wife team having the contract for a five day service, plus limited service on Sundays to permit users to attend church. The Pas' service is operated by the Pas Handivan Inc. which employs a driver and a dispatcher/office manager five days a week. They also have a charter service available during evenings and weekends.

(ii) Part-time and volunteer drivers in conjunction with the municipal office.

Boissevain has a unique system in which the handivan is parked at the Beckoning Hills Activity Centre which is one method of advertising that it is available to everyone who needs a special transportation service. Requests for the handivan are made to the municipal radio operator who has both a radio and telephone link to the part-time and volunteer drivers who are on-call.

The total population of Boissevain and the R.M. of Morton is about 2,600 which is one of the smaller communities in the program, but they have one of the busiest operations.

(iii) Part-time and volunteer drivers in conjunction with a personal care home or hospital.

a) This is the most common type of operation and is being used in the R.M. of Argyle, Emerson, Glenboro, Minnedosa, Morden and Souris. Drivers are often on the staff of the personal care home or hospital or someone associated with it. This type of service is suited to communities with a small demand for service.

In selecting a method most suitable for the community, attention should be paid to the availability of drivers and facilities, finances available and driver licence qualifications with respect to operation of this dual purpose vehicle as an ambulance, and federal/provincial requirements if user charges are levied.

b) Provision of Services

The provision of services for the multi-purpose vehicle should as a minimum reflect those contained within the program guidelines for handivan operation, i.e.

(i) The service provided must meet a minimum standard of providing the community 40 hours of operation within a seven day period. The timing of service is to be determined by the peak periods of request.

(ii) A telephone dispatch system will be in operation at least one-half hour before the commencement of each days service and will continue for at least one hour after service has been completed.

(iii) Service will be from the door of pickup to the door of destination. There will be no centralized pickup or dropoff locations.

(iv) In cases where demand exceeds capacity, service will be carried out on a priority system based on the following criteria:

(1) Nature of transportation:

Ambulance
Wheelchair
Semi-ambulatory
Vision impairments
All other handicapped persons

(2) Purpose of trip:

Emergency medical
Employment
Medical
Education
Personal business, social or recreation

c) Vehicle Housing, Maintenance and Dispatch

For the ambulance and handivan program each community has addressed vehicle housing, maintenance and dispatch in a manner which best reflects local needs. Vehicles are housed in shelters of personal care homes, hospitals, ambulance drivers', houses, etc. Similar arrangements exist for dispatch arrangements and servicing. For the demonstration program it is recommended that the community of Minitonas propose arrangements which best meet their needs and review these with the Manager of Transportation Policy, Programs and Research Division.

d) User Charges

To assist in defraying operating costs it is recommended that a user fee for the service be established by the municipality. It is recommended that user fees for the demonstration program reflect the requirements contained within the program guidelines for handivan operations, i.e.:

(i) the fees as a minimum should cover approximately 25% of gross operating expenses;

(ii) where municipalities allow any use of a vehicle to carry persons who do not fail within the definition of handicapped persons (as defined by the Province), with the exception of escorts, a user fee will be levied that covers the fuel cost of transporting such persons. Table 1 illustrates the range of user charges that have been instituted for handivan services in rural Manitoba.

3. Evaluation

After the logistics of the demonstration program have been worked out with the community the evaluation phase will commence. It is proposed that in order to gather meaningful data for analysis that the evaluation/data collection phase span two consecutive years. Based on experience in other communities, use varies considerably from season to season and initially it often takes a period of time before people understand, accept and use the service as it was intended to be used. The evaluation phase of the demonstration program will incorporate all current requirements with respect to the federal government (Appendix B) and wil also take into consideration the relevant surveys currently being developed by the provincial government. It is proposed that the evaluation/data

Table 1. Sample Handivan Fares in Rural Manitoba

HANDIVAN FARES

AS AT MAY 31, 1985

COMMUNITY	ONE WAY TRIP IN TOWN	ONE WAY TRIP OUT OF TOWN	RETURN TRIP IN TOWN	RETURN TRIP OUT OF TOWN	NO. OF PERSON TRIPS IN 1984
R.M. OF ARGYLE	$ .75		$1.50		319*
BOISSEVAIN	$ .75	$.75 plus $.24 per km			4703
EMERSON	$1.50	$.20 per km	$3.00	$.20 per km	74*
R.M. OF GIMLI	$1.00 up to 10 km	$1.50 over 10 km	$2.00	$3.00	6347*
MINNEDOSA	$2.00	$2.00 plus $.22 per km	$4.00	$2.00 plus $.22 per km	314*
MORDEN	$1.50	$1.50 plus $.25 per km	$3.00	$3.00 plus $.25 per km	959*
NEEPAWA	$2.00	$1.50 plus $.32per mile	$4.00	$1.50 plus $.32per mile	3605
SELKIRK	$1.25	$1.75	$1.25	$1.75	7870
SOURIS			$2.00		2229
STEINBACH	$3.00	$.50per mile	$3.00	$.50per mile	3967
THE PAS	$1.75	$3.00	$2.75	$6.00 (limit of 7 mile radius)	10034

* Provided a service for eight months in 1984.

collection phase be coordinated through the Manager, Transportation Programs, Manitoba with participation from the Transportation Development Centre (TDC).

The evaluation phase of this program is comprised of three major areas:

(a) Technical Performance of the Vehicle;
(b) Use;
(c) Financial.

a) Technical Performance

It is proposed that a vehicle maintenance log be kept recording dates of service, nature of service problem and related expenses. Table 2 is a simplified format of the log illustrating the types of information required.

Table 2. Proposed Vehicle Technical Log (Service Maintenance)

VEHICLE TECHNICAL LOG (SERVICE MAINTENANCE)				
DATE	DESCRIPTION OF PROBLEM, REPAIRS MADE	DRIVER/MECHANIC COMMENTS	SERVICED BY	COST

Any outstanding or unusual service difficulties associated with the dual purpose vehicle which are encountered during the two year demonstration program should be relayed to the Manager, Transportation Programs for immediate attention.

At the end of the first year of operation, a summary vehicle technical report should be prepared and presented to TDC. This report will comprise a written analysis of the technical log. At the end of the two year period a detailed overall technical evaluation will be required.

b) Use

Appendix B provides a summary of the information requirements of the provincial and federal governments with respect to the existing handivan program. Although the dual purpose (handivan/ambulance) service will serve a somewhat modified need it is proposed that the Handivan Questionnaire format be modified and used to evaluate this aspect of the demonstration program. It is also proposed that both the dispatcher and vehicle driver maintain logs similar to the ones depicted in Tables 3 and 4.

In addition to use, it is recommended that the questionnaire be modified to provide for critique with respect to vehicle design and layout, e.g. are there enough wheelchair stations - are they appropriately situated?, etc.

It is proposed that these logs be modified to accommodate information on vehicle use as on ambulance. Information contained within these logs should be analysed and a summary report prepared at the close of year one of the Program. A comprehensive evaluation will be required at the completion of two years' operation.

c) Financial

While it is recognized that budgets will vary extensively from community to community, for evaluation purposes a simple income statement and balance sheet will be required. Table 5 contains a sample format for a statement of revenue and expenditures.

In addition, in keeping with provincial and federal requirements for related programs an audited financial statement will be required at the close of year one and two of the demonstration program.

4. Program Analysis

At the end of year one, it is proposed that an interim report be prepared on operations for the first year. At that time, recommendations for changes can be made if required. At the end of the two year Demonstration Program a comprehensive evaluation report should be prepared in consultation with the Manitoba government.

Table 3. Sample Dispatch Log

HANDIVAN DAILY DISPATCH SHEET

Date: _____ Dispatcher's Name: _____

Customer's Name	Pick-up At	Pick-up Time	Deliver To	No. of People	Transportation Handicap						Trip Purpose								Special Instructions
					W	A	WE	AE	AD	O	E	M	S	SB	R	DC	V	O	
				TOTALS															

TRANSPORTATION HANDICAP CODES
W-Wheelchair
A-Ambulatory
WE-Wheelchair Elderly
AE-Ambulatory Elderly
O-Other(Specify)
AD-Aide

TRIP PURPOSE CODES
E-Employment
D-Day Care
M-Medical
S-School
SB-Shopping/Business
R-Recreation
O-Other(Specify)
V-Visiting

FARES RECEIVED _____

Sheet ___ of ___

SYPHER

Table 4. Sample Driver's Daily Trip Log

DRIVER'S DAILY TRIP RECORD

Date: _____ Driver's Name: _____

Trip No.	Customer's Name	Pick-Up At	Deliver To	Drop-off Time	Pick-Up Time	Riding Time	No. of People	Km Ending	Km Starting	Distance	Fare	Cash/ Acct.	Special Instructions
		Odometer Reading End of Day _____	Start of Day _____	Difference _____									Sheet ____ of ____

Table 5. Sample Format for Statement of Revenue and Expenditures

SAMPLE

Statement of Revenue and Expenditures
for the year ending December 31, 1985

Revenue		
User fees	$_____	
Grants	_____	
- Province of Manitoba	_____	
- operating	_____	
- start-up	_____	
- capital	_____	
- other (specify)	_____	
- Town of _____	_____	
- R.M. of _____	_____	
Donations	_____	
Fund Raising	_____	
Other	_____	
Total Revenue		$_____
Expenditures		
Wages and Benefits	$_____	
Administration	_____	
Vehicle		
- Gas and oil	_____	
- Repairs and maintenance	_____	
- licences and insurance	_____	
- storage	_____	
- depreciation	_____	
Radio Licences	_____	
Advertising	_____	
Office Supplies	_____	
Professional Fees	_____	
Rent	_____	
Utilities	_____	
Telephone	_____	
Travel Expenses	_____	
Reserve for Bad Debts	_____	
Bank Charges	_____	
Miscellaneous	_____	
Total Expenses		$_____
Excess of Revenue over Expenditures		$_____

APPENDIX B

PROVINCIAL/FEDERAL INFORMATION REQUIREMENTS

HANDIVAN PROGAM

File No: 15-46-1

August 21, 1985

[redacted]

Dear [redacted]:

Your community was one of twelve that recently purchased a handivan with federal financial assistance. One of the clauses of the agreement the Province signed to obtain the federal funding required that an evaluation be made of the effectiveness of the handivans. The evaluation requires a survey of users regarding their perception of their accessibility to social services, health services, schools and employment centres both before and after acquisition of the vans. A second portion of the evaluation requires that the annual operating costs and the annual revenue be determined.

To provide the accessibility information to the federal government we have prepared a questionnaire that each user of the handivan should be given an opportunity to complete. Copies of the questionnaire are attached for your use. We request that you consolidate the completed questionnaires and return them to the Transportation Policy, Programs and Research Division by March 1, 1986.

We have also enclosed a statistical form to record the number of passenger trips by trip purpose. This form will also be required March 1, 1986.

To assist you with your financial accounting, we have attached a sample income statement and balance sheet you may wish to use when submitting your audited financial statement and application for an operating grant.

If I may be of assistance please feel free to call me at 945-2009.

Yours truly,

Wes Graham
Manager
Transportation Programs
Transportation Policy, Programs
& Research Division

IP/CS:HANDI-SURVEY

Attachments

Mr. Al Perreaux
Chairman
Dauphin & Disrict Handi-van
251 Centennial Drive
Dauphin, Manitoba
R7N 3C7Mr. Perreaux
Mr. Ron Amey
Secretary Treasurer
102 Broadway St. S.
Deloraine, Manitoba
R0M 0M0Mr. Amey
Mr. Lloyd Agnew
Chairman
Hartney Handi-van
Box 339
Hartney, Manitoba
R0M 0X0Mr. Agnew
Mr. Edmond Beaudette
Secretary Treasurer
Box 339
Lac du Bonnet, Manitoba
R0E 1A0Mr. Beaudette
Mr. Ron Forsman
President
Neepawa & District Disabled
Persons Assoc. Inc.
Box 483
Neepawa, Manitoba
R0J 1H0Mr. Forsman
Mr. Gerald Fontaine
St. Pierre-Jolys Handivan
Box 218
St. Pierre-Jolys, Manitoba
R0A 1V0Mr. Fontaine
Mr. Mark Neskar
c/o Souris Hospital
Box 10
Souris, Manitoba
R0K 2C0Mr. Neskar
Mr. Harold Jones
Stonewall Handyvan
Box 250
Stonewall, Manitoba
R0C 2Z0Mr. Jones
Mr. K.P. Aujlay
Administrator
Vita and District Health Centre
Vita, ManitobaMr. Aujlay
Mr. Doug McEwen
City Clerk
City Hall
Thompson, Manitoba
R8N 1S6Mr. McEwen

Dr. Howard Zacharias
Eden Health Centre
1500 Pembina Avenue
Winkler, Avenue
R0G 2X0Dr. Zacharias
Mrs. Nancy Nemec
President
Winnipegosis Handyvan
230 Bridge Street
Winnipegosis, Manitoba
R0L 2G0Mrs. Nemec

HANDIVAN QUESTIONNAIRE

1. How often do you use the service?

1 - 5 times per month	_____
6 - 10 times per month	_____
11 - 15 times per month	_____
16 - 20 times per month	_____
21 - 30 times per month	_____
31 - 40 times per month	_____
41 - 50 times per month	_____
51 - 60 times per month	_____
More than 60 times per month	_____

2. Do you use the handivan for:

Work	_____	Visiting	_____
School	_____	Recreation	_____
Medical Appointments	_____	Day Care	_____
Shopping/Business	_____	Other	_____

3. Do you use:

A wheelchair	_____
Other mobility aids	_____

4. How were your transportation needs met before your community purchased a handivan?

By friends or relatives	_____
By taxi	_____
By a service or community club	_____
Other	_____

5. Prior to your community receiving a handivan, were your transportation needs to work, school, medical appointments, shopping/ business, visiting, recreation, and day care being met?

Very Well _____
Adequately _____
Fair _____
Poor _____

6. Now that your community has a handivan, are these needs being met?

Very Well _____
Adequately _____
Fair _____
Poor _____

SAMPLE

Statement of Revenue and Expenditures for the year ending December 31, 1985

Revenue

User fees	$_____	
Grants		
- Province of Manitoba		
- operating		
- start-up		
- capital		
- other (specify)		
- Town of _____		
- R.M. of _____		
Donations		
Fund Raising		
Other		
Total Revenue		$_____

Expenditures

Wages and Benefits	$_____	
Administration		
Vehicle		
- Gas and oil		
- Repairs and maintenance		
- licences and insurance		
- storage		
- depreciation		
Radio Licences		
Advertising		
Office Supplies		
Professional Fees		
Rent		
Utilities		
Telephone		
Travel Expenses		
Reserve for Bad Debts		
Bank Charges		
Miscellaneous		
Total Expenses		$_____
Excess of Revenue over Expenditures		$_____

SAMPLE BALANCE SHEET
AS AT DECEMBER 31, 1985

ASSETS

Current Assets

Cash	$_____
Grant Receivable	_____
	$_____

Fixed Assets

Cost	$_____
Less: Accumulated Depreciation	_____
	$_____

SURPLUS

Operating	$_____
Plant - Capital Grants & Donations	_____
	$_____

NUMBER OF PERSON TRIPS BY TRIP PURPOSE

COMMUNITY _____

MONTH	EMPLOYMENT	MEDICAL	DAY CARE	SCHOOL	SHOPPING/ BUSINESS	RECREATION	VISITING
JANUARY							
FEBRUARY							
MARCH							
APRIL							
MAY							
JUNE							
JULY							
AUGUST							
SEPTEMBER							
OCTOBER							
NOVEMBER							
DECEMBER							
TOTALS							

FARE STRUCTURE: ONE WAY TRIP IN TOWN _____
ONE WAY TRIP OUT OF TOWN _____
CHARTERS _____
OTHER _____

NUMBER OF PERSON TRIPS BY TRIP PURPOSE

SCHOOL	SHOPPING/ BUSINESS	RECREATION	VISITING	OTHER	TOTALS	TRIPS REFUSED	KM TRAVELLED	USER FEES COLLECTED

_____
_____
_____
_____